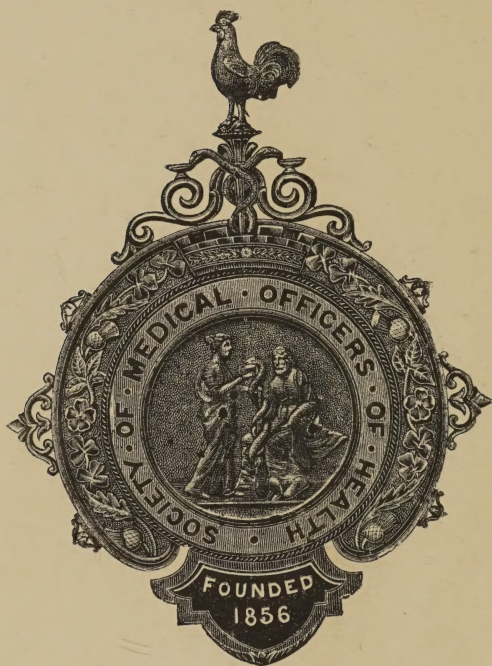


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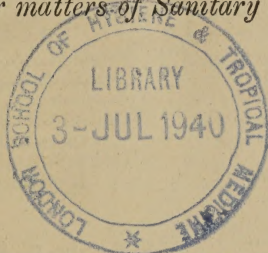
H. Moore  
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# Hygiene

A SANITARY AND SOCIAL MAGAZINE,

DEVOTED TO THE CONSIDERATION OF

*Public Health, House Building, Drainage, Ventilation, Warming, Foods, Beverages, Dietetics, Adulteration, Health Resorts and Mineral Springs, Domestic Medicine and Sanitation, Regimen for the Sick Room, New Articles of Food, New Remedies and Inventions, with other matters of Sanitary and Social Importance.*



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VOL. V.

JANUARY TO DECEMBER, 1892.

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1892.



## INDEX.

|                                                  | PAGE                  |                                               | PAGE                    |
|--------------------------------------------------|-----------------------|-----------------------------------------------|-------------------------|
| ABBOTTS, Dr. W. :—                               |                       | Caviare .....                                 | 160                     |
| Patent Medicines, 23, 115, 174, 225, 270,        |                       | Certain, but not Sure .....                   | 62                      |
| 342, 370; Cookery, its Social and                |                       | Children, Protection of .....                 | 64                      |
| Hygienic Importance, 90; Heating and             |                       | China .....                                   | 291                     |
| Ventilation of Board Schools, 120;               |                       | Cholera .....                                 | 230, 279, 315, 318, 323 |
| Glycerine, its Manufacture, Properties,          |                       | CHUDLEIGH, Rev. R. A. :—                      |                         |
| and Uses .....                                   | 184, 199              | On Sea Air .....                              | 218                     |
| Aberdeen .....                                   | 161                   | Churchyards, Crowded .....                    | 223                     |
| Accidents .....                                  | 31, 324               | Clergy, The Claims of Sanitary Science on the | 287                     |
| Adulteration .....                               | 128                   | Cocoa .....                                   | 127                     |
| Air .....                                        | 273, 321              | Coffee-tea .....                              | 62                      |
| Air and Water of London .....                    | 97                    | Cold Bath, The Dangers of the .....           | 69                      |
| Alehouses .....                                  | 32                    | College of Surgeons, and Members.....         | 223                     |
| ALLEN, Dr. NATHAN :—                             |                       | Condensed Milk .....                          | 159                     |
| Laws of Longevity .....                          | 257, 306, 345         | Consumption, 170; Prevention of .....         | 62                      |
| Amusements of Great Men.....                     | 78                    | Cookery Classes for Sailors .....             | 355                     |
| Analytical Reports .....                         | 156, 192              | Cottage Homes for the Industrial Classes..... | 26, 54                  |
| ANDERSON, WILLIAM, D.C.L., F.R.S. :—             |                       | Country Life .....                            | 166                     |
| The Purification of Water by Metallic Iron       | 5                     | County Councils .....                         | 76                      |
| Annali dell' Istituto d'Igiene (Rev.) .....      | 221                   | CRAWFORD, Sir THOMAS :—                       |                         |
| Anonymous Abuse .....                            | 174                   | On English Homes .....                        | 318                     |
| Antidote for Snake Bite.....                     | 31                    | CRESPI, Dr. A. J. H. :—                       |                         |
| Architecture in Relation to Hygiene .....        | 33                    | Work and Exercise, 112; The Claims of         |                         |
| Artificial Eardrums .....                        | 225                   | Natural History, 135; Dietetic                |                         |
| Assurance, Life.....                             | 92                    | Therapeutics, 150; Country Life, 166;         |                         |
| " Health .....                                   | 237                   | The Water Supply of Villages, 206;            |                         |
| Athletic Sports in Relation to Public Health.... | 35, 82                | The New Forest, 210; The Wimborne             |                         |
| B.                                               |                       | Centenarian, with some Remarks on             |                         |
| Baby-farming .....                               | 324                   | Total Abstinence, 242; Curiosities of         |                         |
| Baillie's Pills.....                             | 174                   | Diet, 262; Fruit, 302; The Physical           |                         |
| Balsamic Elixir, Congreve's .....                | 370                   | and Mental Disqualification of Women          |                         |
| Banana, The .....                                | 219                   | for Hard Work .....                           | 330, 366                |
| BARENZ, Professor :—                             |                       | Crime .....                                   | 281, 351                |
| Handwriting in Relation to Hygiene .....         | 204                   | Crops .....                                   | 31                      |
| Battersea .....                                  | 347                   | Croydon .....                                 | 163                     |
| BAUGH, PERCY K. :—                               |                       | CUNNINGHAM, Surgeon-General :—                |                         |
| Concerning Great Men's Amusements and            |                       | Quarantine.....                               | 41                      |
| Eccentricities .....                             | 38                    | CUNNINGHAM, GEORGE, M.A., L.D.S. :—           |                         |
| Beecham's Pills .....                            | 23                    | Hygiene of the Teeth .....                    | 71, 109, 145            |
| Bethnal Green .....                              | 96                    | D.                                            |                         |
| BINNIE, Mr. A. R., C.E. :—                       |                       | DAVIES, Dr. D. S. :—                          |                         |
| On Water Supply .....                            | 293                   | Factory and Workshops Acts.....               | 108                     |
| Birkenhead .....                                 | 282                   | Dead Sea, The .....                           | 64                      |
| Birmingham .....                                 | 162                   | Diet .....                                    | 127, 262                |
| BLOOMFIELD, Sir ARTHUR W. :—                     |                       | Dietetic Gazette .....                        | 387                     |
| On Architecture in Relation to Hygiene ...       | 33                    | " Notices .....                               | 127, 281                |
| Board Schools, Heating and Ventilation of .....  | 120                   | " Therapeutics .....                          | 150                     |
| Bread .....                                      | 46, 187, 275          | Dietary of Troops.....                        | 308                     |
| Brighton .....                                   | 162                   | Digestion .....                               | 234                     |
| British Health Resorts.....                      | 6, 142, 181, 210, 245 | Distilleries.....                             | 292                     |
| Bromine .....                                    | 260                   | Dixon's Pills .....                           | 174                     |
| BUCHANAN, Sir GEORGE, M.D., F.R.S. :—            |                       | DRYSDALE, Dr. C. R. :—                        |                         |
| Precautions against Cholera .....                | 230                   | The Rational Punishment of Crime.....         | 281                     |
| Building Regulations .....                       | 288                   | Dublin .....                                  |                         |
| Butter.....                                      | 192                   | DUFFIELD, Dr. ORME :—                         |                         |
| Buxton .....                                     | 181                   | Hospital Accommodation of Metropolis          |                         |
| C.                                               |                       | for Patients Suffering from Infectious        |                         |
| Cacao .....                                      | 219                   | Diseases .....                                | 327                     |
| Camberwell .....                                 | 355                   | DUJARDIN-BEAUMETZ, Professor :—               |                         |
| CAMERON, Sir CHARLES A., D.P.H. :—               |                       | On Vegetarianism .....                        | 12                      |
| Presidential Address, Sanitary Congress.....     | 315                   | Dundee .....                                  | 164                     |
| CAMERON, Mr. :—                                  |                       | Dwellings of the Poor .....                   | 325, 356                |
| Use of Steam in Weaving Factories .....          | 58                    | E.                                            |                         |
| Canary Isles, Winter and Spring in the .....     | 336, 362              | Easily Satisfied.....                         | 256                     |
| Cardiff .....                                    |                       | Eastern Story .....                           | 62                      |
| CARPENTER, Dr. ALFRED :—                         |                       | Eccentricities of Great Men .....             | 78                      |
| The Power of Soil and Vegetation to              |                       | Electric Belts, ; Light .....                 | 338                     |
| Destroy Disease Germs .....                      | 50                    | Elmira, The Reformatory at .....              | 281                     |
| In Memoriam .....                                | 61                    | Emigration .....                              | 233                     |



|                          | PAGE              |
|--------------------------|-------------------|
| EMINSON, Dr. :—          |                   |
| Epidemic Pneumonia ..... | 177               |
| Epidemics .....          | 41, 103, 131, 353 |
| Epping .....             | 155               |
| Essex .....              | 32                |

## F.

|                                                  |              |
|--------------------------------------------------|--------------|
| Factories .....                                  | 62, 108, 232 |
| Farinaceous Foods, Preserved .....               | 206          |
| Fashion .....                                    | 126          |
| Fires in London .....                            | 356          |
| FLETCHER, H.M. Inspector, A. E. :—               |              |
| Noxious Gases from Manufacturing Processes ..... | 1            |
| Fogs .....                                       | 62, 192      |
| Food Prices .....                                | 51           |
| Foster, Sir Walter .....                         | 323          |
| Fothergill's Pills .....                         | 174          |
| Fox, Dr. J. T. :—                                |              |
| Strathpeffer Spa .....                           | 245          |
| Fruit .....                                      | 302          |
| Fulham .....                                     | 217          |
| Funeral Reform .....                             | 128          |

## G.

|                                                                             |          |
|-----------------------------------------------------------------------------|----------|
| Gambling on Lives .....                                                     | 32       |
| GATEHOUSE, Mr. J. W., F.I.C. :—                                             |          |
| The Sanitary Significance of Chlorides and Nitrates in Drinking Water ..... | 129      |
| Gentleman's Hat, A. ....                                                    | 388      |
| Germany .....                                                               | 255      |
| GILLESPIE, Rev. C. G. K. :—                                                 |          |
| The Claims of Sanitary Science on the Clergy .....                          | 287      |
| Glasgow .....                                                               | 164      |
| Glycerine .....                                                             | 184, 199 |
| Godes-Berger .....                                                          | 322      |
| Gold Cure for Drunkenness .....                                             | 270      |
| GOODFELLOW, Professor :—                                                    |          |
| The Dietetic Value of Bread .....                                           | 187      |
| Gourmand and Gourmet .....                                                  | 281      |
| GULL, Sir W. W. (the late) :—                                               |          |
| Typhoid Fever .....                                                         | 280      |

## H.

|                                                    |          |
|----------------------------------------------------|----------|
| Habit .....                                        | 255      |
| HALLETT, Mr. HOLT S., C.E. :—                      |          |
| Reduced Working Hours in Factories .....           | 232      |
| HAMILTON, Dr. :—                                   |          |
| On Consumption .....                               | 170      |
| HAMER, Mr. JOHN :—                                 |          |
| The State and the Homes of the Poor .....          | 325      |
| HAMILTON, Dr. J. L. :—                             |          |
| On Oysters .....                                   | 382      |
| Handwriting in Relation to Hygiene .....           | 65, 204  |
| Henley .....                                       | 383      |
| Hastings .....                                     | 356      |
| Health, Laws of .....                              | 359      |
| Health Record, The .....                           | 387      |
| Heating and Ventilation of Schools .....           | 120      |
| Henbane in Soup .....                              | 224      |
| Homes of the Poor .....                            | 326      |
| HOOLE, Dr. HENRY :—                                |          |
| Athletic Sports in Relation to Public Health ..... | 35, 82   |
| Hospital Sanitation .....                          | 251, 273 |
| House Drains .....                                 | 202      |
| "Housing of the Working Classes" Act .....         | 192      |
| Howard Association .....                           | 351      |
| Huddersfield .....                                 | 162      |

## I.

|                                 | PAGE       |
|---------------------------------|------------|
| Idleness .....                  | 292        |
| Ignorance .....                 | 323        |
| Imagination, Power of the ..... |            |
| Impediments of Speech .....     | 159        |
| Infectious Diseases .....       | 327, 388   |
| Influenza .....                 | 32         |
| Injurious Schooling .....       | 295        |
| Insanitary Dwellings .....      | 32, 62, 96 |
| Ireland .....                   | 31, 192    |
| Italian Wines .....             | 314        |
| Italy .....                     | 388        |

## J.

|                                          |     |
|------------------------------------------|-----|
| JACKSON, Mr. JOHN :—                     |     |
| Handwriting in Relation to Hygiene ..... | 65  |
| Jockey's Diet, A .....                   | 222 |

## K.

|                           |     |
|---------------------------|-----|
| Kensington .....          | 282 |
| Knowledge, Taxes on ..... | 224 |

## L.

|                                     |                  |
|-------------------------------------|------------------|
| Ladies' Dress .....                 | 19, 324          |
| Land, Unequal Distribution of ..... | 388              |
| Landlords, Prayer for .....         | 356              |
| LAWFORD, Mr. G. M. :—               |                  |
| On House Drains .....               | 202              |
| Leamington .....                    | 6                |
| Lee's Pills .....                   | 174              |
| Leeds .....                         | 165              |
| Life Assurance .....                | 92               |
| Lightning Conductors .....          | 192              |
| Lincoln .....                       | 128, 154, 347    |
| Liverpool .....                     | 165              |
| Local Option in a Workhouse .....   | 31               |
| London, Water Supply .....          | 32, 63, 223, 255 |
| "    Sanitary Condition of .....    | 347              |
| Longevity .....                     | 257, 308, 345    |

## M.

|                                                     |          |
|-----------------------------------------------------|----------|
| Malvern .....                                       | 142      |
| Manchester Ship Canal .....                         | 356      |
| Margarine .....                                     | 62       |
| Mattei .....                                        | 225, 270 |
| Mercantile Marine, Medical Supervision of the ..... | 102      |
| Metropolitan Asylums Board .....                    | 156, 388 |
| Metropolitan Water Supply .....                     | 31, 356  |
| Microscope .....                                    | 223      |
| Middle Class Organisation .....                     | 221      |
| Milk .....                                          | 287      |
| MOODY, Dr. GERALD T. :—                             |          |
| Bromine and Iodine as Aerial Disinfectants .....    | 260      |
| MOOR, Mr. C. G. :—                                  |          |
| The Disposal of Sewage .....                        | 55       |
| Morphia Injections .....                            | 292      |
| Morrison's Pills .....                              | 174      |
| Mother Seigel's Syrup .....                         | 225      |

## N.

|                                           |          |
|-------------------------------------------|----------|
| NANSEN, Dr. :—                            |          |
| On Stimulants in Cold Climates .....      | 379      |
| National Health Society .....             | 224      |
| Natural History .....                     | 135      |
| Newcastle-on-Tyne .....                   | 383      |
| New Forest .....                          | 210      |
| Norwegian Ice .....                       | 216      |
| Notification of Infectious Diseases ..... | 324, 388 |



|                                                | PAGE |
|------------------------------------------------|------|
| Noxious Gases from Manufacturing Processes ... | 1    |
| Nursery Hygiene .....                          | 30   |

O.

|                                 |     |
|---------------------------------|-----|
| "Ouida," on Women's Dress ..... | 19  |
| Oysters .....                   | 382 |

P.

|                                                                        |                   |
|------------------------------------------------------------------------|-------------------|
| Paraguayan Tea .....                                                   | 292               |
| PARKES, Dr. LOUIS :—<br>The Air and Water of London .....              | 97                |
| PARSONS, Dr. F. H. :—<br>Winter and Spring in the Canary Isles ...     | 336, 362          |
| Pastures .....                                                         | 62                |
| Patent Medicines.....23, 115, 174, 225, 270, 342,                      | 370               |
| Patent Medicine Stories .....                                          | 62                |
| Petroleum .....                                                        | 323               |
| Pharmacopoeia, Curious Addition to the.....                            | 63                |
| Physical Education .....                                               | 375               |
| Physiology .....                                                       | 234               |
| Pineapple .....                                                        | 324               |
| PLUMBE, Mr. ROWLAND :—<br>Cottage Homes for the Industrial Classes ... | 26, 54            |
| Plumbers, Registration of .....                                        | 96, 128, 323, 355 |
| Pneumonia .....                                                        | 177               |
| Portsmouth .....                                                       | 292               |
| Potato Disease .....                                                   | 256               |
| Poultry and Game .....                                                 | 62                |
| POWER, Sir ALFRED :—<br>The Skin .....                                 | 198               |
| Preston .....                                                          | 165               |
| Prisoners, Diet of.....                                                | 192               |
| Protectionist Tariff .....                                             | 128               |
| Public Health Reports...94, 125, 151, 217, 249,<br>282, 319, 347,      | 382               |

Q.

|                                |     |
|--------------------------------|-----|
| Quackery, Suppression of ..... | 225 |
|--------------------------------|-----|

R.

|                                                                                   |     |
|-----------------------------------------------------------------------------------|-----|
| Railway Carriages, Reading in .....                                               | 60  |
| Warming of.....                                                                   | 63  |
| READ, Mr. R. :—<br>Sewer and Drain Ventilation.....                               | 298 |
| REUSS, Professor :—<br>Handwriting in Relation to Hygiene .....                   | 204 |
| Reviews and Notices of Books.. 30, 59, 123, 156,<br>187, 221, 253, 286, 315, 353, | 386 |
| Rivers, Pollution of.....                                                         | 356 |
| Revista Internazionale d'Igiene .....                                             | 222 |
| Revue Internationale des Falsifications .....                                     | 222 |
| ROBINSON, Professor HENRY :—<br>Sewage Disposal .....                             | 357 |
| RUSSELL, Hon. ROLLO :—<br>Epidemics, Plagues, and Fevers .....                    | 353 |

S.

|                                                                                   |     |
|-----------------------------------------------------------------------------------|-----|
| Sanitary Congress, 316 ; Institute, 96 ; Inspec-<br>tors, 291 ; Legislation ..... | 324 |
| Scarborough .....                                                                 | 125 |
| Schools, Epidemics in .....                                                       | 120 |
| " Hygiene of.....                                                                 | 266 |
| Scorpion Stings.....                                                              | 342 |
| Scotland .....                                                                    | 31  |
| Sea Air .....                                                                     | 218 |
| Seaport Towns, Improved Health of .....                                           | 21  |
| Sewage .....                                                                      | 55  |
| " Disposal of.....                                                                | 357 |
| Sewer Ventilation .....                                                           | 298 |

|                                                                         | PAGE     |
|-------------------------------------------------------------------------|----------|
| SHELLY, Dr. C. E. :—<br>Epidemics in Schools .....                      | 103, 131 |
| Shop Hours .....                                                        | 96, 256  |
| Sleeping Like a Dog .....                                               | 255      |
| Sleeplessness .....                                                     | 255      |
| Small Pox Statistics .....                                              | 184      |
| SMART, Dr. T. W. :—<br>The Cold Bath and its Danger .....               | 69       |
| Snake, A Remarkable .....                                               | 256      |
| Soil and Vegetation, their Power over Disease<br>Germs .....            | 50       |
| Southampton .....                                                       | 151, 157 |
| St. George's, Hanover Square .....                                      | 94       |
| St. Luke's .....                                                        | 249      |
| St. John's Ambulance Association .....                                  | 63       |
| Stammering and Stuttering .....                                         | 159      |
| State, The, and Homes of the Poor .....                                 | 325      |
| Steam in Weaving Factories .....                                        | 58       |
| Stockton-on-Tees .....                                                  | 356      |
| Strychnine, Antidote for .....                                          | 31       |
| STURGES, Dr. OCTAVIUS :—<br>Physical Indications of Injurious Schooling | 295      |
| Sugar .....                                                             | 64       |

T.

|                                                                                                 |              |
|-------------------------------------------------------------------------------------------------|--------------|
| TAYLOR, Dr. J. STOPFORD :—<br>Medical Supervision of the Mercantile<br>Marine.....              | 102          |
| Teeth, Hygiene of the ..                                                                        | 71, 109, 143 |
| THRESH, Dr. J. C. :—<br>Small Pox Statistics, 184 ; Housing of the<br>Working Classes Act ..... | 193          |
| Tobacco Smoke.....                                                                              | 160          |
| Total Abstinence .....                                                                          | 242          |
| Trees in London .....                                                                           | 388          |
| Typhoid Fever .....                                                                             | 123, 280     |
| TYRRELL, Dr. WALTER :—<br>Malvern as a Health Resort .....                                      | 142          |

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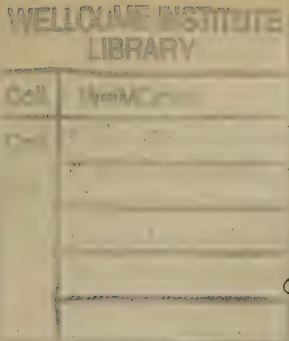
|                     |     |
|---------------------|-----|
| United States ..... | 291 |
|---------------------|-----|

V.

|                                                  |     |
|--------------------------------------------------|-----|
| Vegetable Kingdom, Utility of the .....          | 355 |
| Vegetarianism .....                              | 12  |
| Vegetarian Dishes .....                          | 386 |
| Villages, Water Supply of .....                  | 206 |
| Vinegar .....                                    | 223 |
| Vivisection, How to Deprive of its Horrors ..... | 255 |

W.

|                                                                    |     |
|--------------------------------------------------------------------|-----|
| WALFORD, Dr. EDWARD :—<br>The Improved Sanitation of Seaport Towns | 21  |
| Warner's "Safe Cure" .....                                         | 115 |
| WARREN, Mr. T. P. B. :—<br>Preserved Farinaceous Foods .....       | 209 |
| Water, Purification of, 5 ; Supply, 31, 63, 161,<br>206, 223, 293, | 356 |
| Wear and Tear .....                                                | 324 |
| WHITE, Mr. GEORGE :—<br>Physical Education .....                   | 375 |
| Wimborne Centenarian, The .....                                    | 242 |
| Wines, Italian .....                                               | 314 |
| WINTLE, Colonel :—<br>The Dietary of Troops.....                   | 308 |
| Women's Dress .....                                                | 19  |
| Working Life, A Happy Life.....                                    | 352 |
| Work and Exercise .....                                            | 112 |



# HYGIENE,

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No. 49.

## THE PRESENT STATE OF BRITISH LAW CONTROLLING THE DISCHARGE OF NOXIOUS GASES FROM MANUFACT- URING PROCESSES.\*

By A. E. FLETCHER, F.I.C., F.C.S., H.M.'s  
Chief Inspector under the Alkali Act.

OWING to the great development of manufacturing industry in recent times, injury to the air has been more and more felt, and especially in districts where are carried on certain chemical trades, from which large volumes of noxious gases are liable to be discharged, gases poisonous either to animal or vegetable life, or to both.

Among such processes may be mentioned those required for the separation of metals from their ores; the preparation of soda, potash, or the alkaline earths from their components, as found in nature; the treatment to which animal and vegetable fibres are subjected to prepare them for the various uses to which they are applied; the preparation of colouring materials; these, and a thousand other operations which are needed for the production of the countless articles considered necessary to the carrying on of our modern civilised life. In the preparation of many of these a noxious gas forms part of the manufacture, and there is therefore a liability of its escaping into the

air. We are greatly dependent on the products of chemical industry for the enjoyment of our daily life, and we cannot afford to stop such manufactures, except in extreme cases, even though they may be the occasion of some amount of pollution to the air around us.

It is recorded that in 1316, in order to purify the air, an edict was passed prohibiting the burning of sea-borne, or bituminous, coal in London, on pain to the offender of having his house pulled down. Modern legislation on air pollution, however, seeks to regulate the offending manufacture, rather than to suppress it. From ancient times rules have been adopted in various localities for regulating certain trades from which noxious exhalations were to be expected; but the first distinct Act of our Legislature which attempted to control the emission of noxious gases from chemical manufacturers was the Alkali Act of 1863. And, as far as I can learn, this was the first legislative Act of the kind in Europe regulating, but not suppressing, the emission of noxious gases from a manufacturing process.

The Alkali Act of 1863 referred to only one noxious gas. Its special object was to restrain manufacturers of soda from common salt from allowing the hydrochloric acid generated by the Leblanc soda process to escape as a gas into the air. This acid was, up to that time, considered mainly as a waste product, to be got rid of as easily as possible. With this object, it was

\* A Paper read at the Congress of Hygiene.



allowed to enter the smoke-flues and pass up the main chimney of the works. In fine, dry weather the acid was carried far away from the factory, and becoming largely diluted with air, inflicted but little perceptible injury on distant vegetation. Generally, however, the moisture in the atmosphere promoted the condensation of the gas; it was carried down by the rain and caused severe injury to neighbouring plants of all kinds. Trees as far as three miles from the works were sometimes denuded of their leaves, and, in a short time, killed; those at even greater distances were injured. The Alkali Act of 1863 made no attempt to stop the soda manufacture, or diminish the activity of the trade, but, in the belief that hydrochloric acid gas could be condensed, and its passage into the air arrested, it enacted that only a certain proportion of the acid generated should be allowed to escape into the air. This amount was fixed at 5 per cent., or one-twentieth part, of the quantity made. It is difficult to know on what ground the figure 5 was chosen. In adopting it, the moderation of the legislature has been abundantly justified, for, at present, of all the hydrochloric acid generated in Great Britain and Ireland, rather more than 98 per cent. is condensed, while less than 2 per cent. is allowed to escape.

In the Act of 1863 a second new departure was made. This was the appointment of inspectors with power to enter factories and ascertain, at all times, whether the provisions of the Act were duly carried out. Hitherto the common law was the only remedy to which appeal could be made in cases where damage had been done by the emission of noxious gases into the air. But it was found insufficient, because no adequate restitution could be made in many of the cases where injury was sustained, and because, where several chemical works closely adjoined each other, there was great difficulty in determining which had been the offender.

In many cases a money payment could not

possibly compensate for damage done. The growing crops on a farm doubtless have a money value, and when destroyed can be paid for in money, but who shall attempt to compensate the owner of an ancestral estate, an ancient hall surrounded by spreading elms and beech, and oaks of centuries' growth, commanding an extensive view of wooded hill and valley, by paying him the timber-value for those trees when destroyed by the acid blast of a chemical work. It is clear that in such a case protection from injury is required, not compensation for injury done. Again, at Widnes, in Lancashire, there are 18 large chemical works closely adjoining one another, all capable of doing similar damage to neighbouring vegetation. It is clear that a farmer whose crops at half a mile distance had suffered injury would find it impossible to ascertain which of the 18 works, or how many of them, had been the authors of the mischief. In a twofold manner, therefore, the common law was found insufficient to provide adequate protection in the cases described. Hence the necessity for the new departure in the Act of 1863. It might have been feared that the inspector of chemical works would be regarded by the manufacturer as a spy, a most unwelcome intruder. This has not been the case. Thanks to the wise method of the first chief inspector, Dr. R. Angus Smith, and the discretion of those who held office under him, their visits have rather been courted than resented. The best of the manufacturers regarded the tests made by the inspector as an additional guard of their interests, a further check upon the correct working of their establishments. The smaller men found that the improvements they were led to make in their apparatus in order to comply with the requirements of the Alkali Act, and the increased care demanded in the manipulations of their operatives, led to generally improved working and increased profits. The effort of the inspectors has been to induce the manufacturers to make constant systematic tests themselves of

the condition and composition of the waste gases of their works, and not to wait till the inspector's tests should show that there was an infringement of the provisions of the Act. The result has been very marked. Whereas in the old time any effort to ascertain the composition of waste gases was almost unknown, now in all suitable cases gas testing is carried out not only by skilled chemists, but as a matter of routine by the workmen themselves. It may also be fairly claimed as a useful result of action taken by the legislature in compelling the manufacturers to prevent the escape of acid gases by their condensation or otherwise, that in so doing, they have been more able to stand their ground against the opposition brought by rival processes. The primary object of the Alkali Act was to compel the alkali manufacturers to condense at least 95 per cent. of the hydrochloric acid they made. This acid was then considered to be in great measure a waste product. Now it is the main source of profit to those who continue to work the Leblanc soda process. Owing to the introduction of a cheaper method for the production of soda, and its consequent reduction in price, the makers by the older method lose on every ton of alkali they sell, but as by the newer process no chlorine compounds are produced, the older makers recoup their loss, and retain their financial position by the sale of these, which are the derivatives of that hydrochloric acid which it has been the object of the Alkali Act to oblige them to conserve. It may thus be asserted that the result of the Alkali Act has been, firstly, to diminish greatly the escape of noxious gases into the air to the injury of vegetation, and of animal life and human health; secondly, to assist the manufacturer in controlling his processes of manufacture; and, thirdly, to aid in educating the workmen by leading them on to habits of precision and careful attention to detail. It was soon seen, however, that though five per cent. of the acid generated in a small work, and well mixed

with air might be comparatively harmless to the surrounding country, yet the same proportion of that produced in a large work might be very destructive. Moreover, whether the initial quantity were large or small, the condensation went on with ease until the last portions were reached. The difficulty increased as the residue became smaller, not in relation to the original amount, but to the residual air with which it was mixed. In other words, the irreducible residue should be described, not as so much per cent. of the quantity first operated on, but as being a certain fraction of the bulk of air mixed with it. Experiments made in this direction showed that it was not difficult to reduce the amount of hydrochloric acid escaping in the chimney gases of an alkali work to two-tenths of a grain in every cubic foot of such gases. In the year 1874 an amended Act was passed, requiring not only that 95 per cent. of the hydrochloric acid gas must be condensed and arrested, but also that condensation must go on until not more than two-tenths of a grain of that acid should be contained in a cubic foot of the air or gases finally emitted. Further it was enacted that the best practical means must be adopted for arresting all other noxious gases given off in the work. No standard is here given of the extent to which this condensation must be carried, but attention is fixed on the means used, which must be the "best practicable." The importance of this clause cannot be overrated, and though it may at first sight be regarded as less precise and binding than a fixed standard, such as formed the basis of the older Act, yet in practice it is found to be all that can be desired and far more comprehensive than any numerical standard. A numerical and fixed standard, though tight and difficult of maintenance to-day, may to-morrow be slack and insufficient in consequence of the introduction of new methods of manufacture, or greater skill of manipulation. It has been so both with the five per cent. and the two-tenth standards; the average amount of



hydrochloric acid now discharged from all the chemical works of the country is less than two per cent., while the fixed limit is five per cent., and less than one-tenth of a grain per cubic foot, while the legal limit is two-tenths. The obligation, however, that a man must use the best practical means for preventing the escape of noxious gases into the air is an ever-tightening bond, accommodating itself to the varying conditions of the problem. Nor is it a bond which can become too tight or oppressive, for who can deny his obligation to use the best practical methods for accomplishing the objects in view? Moreover it cannot be made oppressive by the whim of an inspector, for in conducting a prosecution under the Act, the onus rests on him to show that better and more practicable means for accomplishing the end in view exist. His assertion, too, must be maintained to the satisfaction of judge and jury in open court, in face of the defendant's skilled witnesses.

To this point the Alkali Act had reference only to the hydrochloric acid and other noxious gases liable to be discharged from alkali works. It was, however, recognised that these were not the only works from which acid and other noxious gases might escape. In 1881 a new Act was passed superseding those of 1863 and 1874. In this the main provisions of the older Acts were retained as regards alkali works, but a number of other works were included, from which the more commonly known noxious gases are liable to be emitted. The works now for the first time included were: Sulphuric acid works, chemical manure works, gas liquor works, nitric acid works, sulphate and muriate of ammonia works, chlorine or bleaching powder works, cement works, and salt works. This has caused a great addition to the number of the works originally brought under inspection. The number of registered alkali works in 1890 in Great Britain and Ireland was 133, while there are 901 other works registered under the Act.

It is obvious that no list of chemical manu-

facturers can long be complete. Almost before the ink with which it is written has become dry, some new process has been proposed, and yearly, if not almost daily, we need to make additions if the list is to include all. At present an extended schedule has been drawn up, enumerating six new kinds of chemical works, which it is thought should be added to the list of those which now come under inspection, and constantly further additions might be made as new processes are brought out.

The difficulty thus found of keeping pace with invention arises from the assumed necessity of enumerating the processes of manufacture which are brought under the provisions of the Act. The same difficulty would not arise if instead of naming the *processes* a list were made of the *substances* which are considered noxious, and whose emission is to be kept in check. The Act indeed need take no cognisance of the manufacture if only control be kept over the substances liable to be discharged from it. These noxious volatile substances or gases are not numerous. The following list of eight will be found to include all that are commonly met with: the acid compounds of chlorine, of fluorine, of sulphur, and of nitrogen, chlorine, sulphuretted hydrogen, metallic fumes containing lead, antimony, arsenic, or zinc, and dust or visible fume, as that from cement works.

A Noxious Gases Act, with such a schedule, will be found to include all the works now under the Alkali Act and all works of a similar nature liable to be established. Nor would it be necessary to fix a numerical limit of the amount of each substance that may be discharged into the air; it would be sufficient to enact that the best means must be adopted to prevent such emission. Perhaps one ground for avoiding this comprehensive classification of noxious gases, and for continuing the effort to name separately every manufacturing process from which such gases might emanate, has been the necessity of charging an annual registration

fee on the owner of every work coming within the purview of the Act. The difficulty, however, exists perhaps more in the legal mind than would be found in practice, and the necessity of exacting a registration fee, on which the difficulty rests, has been disputed by many.

It is now 28 years since the passing of the original Alkali Act, and it may be said that the experience of its working has fully borne out the intentions of its framers. For the purpose of its administration the country is divided into seven districts, each being in charge of an inspector, the whole staff being under the superintendence of a chief inspector. It has been found necessary to institute but few prosecutions for contraventions of the provisions of the Act, the effort being to prevent such infractions by activity on the part of the inspectors. No notice is given of their visits, which may be made either by day or night.

If experience has shown the necessity for any amendment in the Act it is only in the direction already indicated, namely, that of rendering the schedule of works which come within its scope more comprehensive by naming the noxious gases which it is desired to control, rather than by specifying the processes of manufacture in connexion with which these gases are liable to be emitted.

### THE PURIFICATION OF DRINKING WATERS BY MEANS OF THE REVOLVING PURIFIER AND METALLIC IRON.

By W. ANDERSON, D.C.L., F.R.S., M.I.C.E.

THE revolving purifier for the treatment of potable waters is no novelty, as it has been at work on a large scale at various places for some six or seven years, and, consequently, it is not necessary to enter into any detailed description of the apparatus, or of its mode of working. For the information, however, of those who are not acquainted with the purifier, a short account may be given. It consists of a cylinder,

supported horizontally on two hollow trunnions, of which one serves for the entrance and the other for the exit of water. The cylinder contains a certain quantity of metallic iron, in the form either of cast-iron borings, or, preferably, of scrap iron, such as punchings from boiler plates. The cylinder is kept in continuous but slow rotation by any suitable means, the iron being continually lifted up and showered down through the passing water by a series of shelves or scoops fixed inside the shell of the cylinder. By this means the water as it flows through is brought thoroughly into contact with the charge of iron, which, in addition, by its constant motion and rubbing together as well as against the sides of the cylinder, is always kept clean and active. There are also simple contrivances for preventing the iron from being carried out of the cylinder or piled up at the outlet end, and for distributing the current water over the whole area of the cylinder.

The water as it leaves the cylinder appears to have undergone only one change of any importance, viz.—a quantity of iron, ranging from one-tenth to one-fifth of a grain to the gallon, has been taken up, and to get rid of this the water has to be aerated, either by blowing in air or by merely allowing it to flow along a shallow open trough; in both cases, repose in a settling reservoir is necessary.

After a few hours—from two to six in most cases, much less in some—the greater part of the iron will have subsided to the bottom of the settling tank, usually as loose flakes of iron peroxide, associated with organic matter and other impurities, and the water is then ready for filtration. In most cases, a rapid passage through a shallow layer of sand is all that is required to separate the iron, which remains as a fine layer on the surface of the sand, while the water issues from the filter free from iron, greatly ameliorated as regards organic matter, and practically deprived of microbes.

The revolving purifier was invented by



myself in 1884-85, to meet the difficulties which arose in the working of the "spongy iron" filters at the Antwerp waterworks. These filters, which consisted of a mixture of "spongy iron" and gravel, choked up gradually and became almost inactive, after working for three years very satisfactorily as regards the purification of the water. They were replaced by the revolving purifiers, which have been in operation there, ever since with most satisfactory results.

Similar results have been obtained on a practical scale at other places. At Boulogne-sur-Seine, a purifier with a six-inch inlet pipe, capable of dealing with 200,000 gallons of water daily, was erected in the summer of 1890, at the pumping station of the Compagnie Générale des Eaux. It was furnished complete with filter beds, and, having worked during the autumn of 1890, remains still in operation. Very exhaustive trials and analyses were made by the Compagnie Générale des Eaux to test the system, principally with respect to the removal of bacteria and of organic matter, as estimated by permanganate of potash. The results obtained are thoroughly satisfactory, especially as regards bacteria.

The numbers determined in the autumn of 1890 are interesting, as illustrating the experimental stage of the working of the system. During the first two periods of working, for which the average percentage reduction of organic matter is given, the charge of iron in the revolving purifier, originally rather deficient, was further reduced by solution; during the third period the charge was made up to its full weight, and kept constant by periodical additions of iron. In the first period the average percentage reduction of organic matter amounted to 42 per cent.; second period, 40 per cent.; third period, 66 per cent. The number of microbes was on the average reduced to 50 per cubic centimètre in all three periods.

The experiments with this purifier were stopped about Christmas, 1890, and the

Compagnie Générale des Eaux ordered plant for dealing with the entire supply from these waterworks; but in order to obtain additional evidence of the efficacy of the system the six-inch machine was started again in May, 1891, and the analyses show a very constant and high condition of purification in very varying states of the river Seine. The mean of analyses demonstrated 63 per cent. of improvement as regards organic matter, while the microbes sank 4,080 per cubic centimetre to only 40.

These latter analyses show that the satisfactory results obtained during the third period in the previous autumn can be considered as normal under any circumstance, and that the Compagnie Générale des Eaux may look forward with confidence to supplying a good potable water from this pumping station as soon as the permanent plant has been set to work.

## BRITISH HEALTH RESORTS.

### No. 18.—Leamington.\*

BY FRANCIS W. SMITH, M.D., Author of  
*"The Saline Waters of Leamington."*

It is impossible to exaggerate the importance of embracing the favourable opportunities which present themselves to individuals and communities. Opportunity makes the general, and opportunity makes the millionaire. There

\* The object of this series is to direct attention to the merits of different British Health Resorts, too often overlooked and neglected by persons who are put to much expense, trouble, and loss of time, in visiting Continental Spas, instead of availing themselves of facilities open to them in their own country. No. 1, Hastings and St. Leonards; No. 2, Cornwall; No. 3, Droitwich and its Brine Baths; No. 4, Swanage; No. 5, Isle of Man; No. 6, Lowestoft; No. 7, Llandrindod Wells; No. 8, Rostrevor (Ireland); No. 9, Cromer and Yarmouth (Norfolk), and Rye and Camber (Sussex); No. 10, Brighton; No. 11, The Undercliff, Isle of Wight; No. 12, Bournemouth, by Rev. R. A. Chudleigh; No. 13, The Climate and Surroundings of Bournemouth; No. 14, Yarmouth; No. 15, Dinsdale-on-Tees; No. 16, Ilfracombe; No. 17, Lyme Regis. Any single number can be had post free by remitting seven stamps.

can be no question that the present is Leamington's golden opportunity. English Spas generally are rising in public favour. Many physicians and specialists, both in London, Scotland, Ireland, and the provinces, instead of exposing their patients to the annoyance and fatigue of foreign travel, are very prudently recommending them to use our Mineral Springs, and it cannot be too often repeated that there is now no need for invalids to run the risks and undergo the inconveniences and discomforts of a journey to the Continent in order to drink Mineral waters. We have as good Saline Springs in Leamington as there are anywhere. In our "temple of health," those who are sick may rest assured of finding relief, and often a cure for many of "the ills that flesh is heir to," and it will be well if patients, who are wearied and worried with the rush to Homburg, Marienbad, and Carlsbad, and the fleecing and flaying experienced at these places, would take this to heart.

Like many health resorts which have risen into notoriety, Leamington, in its early days, consisted of a few thatched cottages. It cannot boast of great antiquity, nor, like Royat and Dax and half a dozen other Continental Spas, claim that Julius Cæsar was cured of his rheumatism by frequenting its baths and drinking its waters; but still it would appear that the healing virtues of our Mineral Waters have been known and appreciated in the immediate neighbourhood, and even throughout the Midland Counties, for hundreds of years. As far back as 1586 mention is made of the Saline Springs of Leamington by Camden, and from that time to this they have had their "ups and their downs." Late in last century, chiefly through the fostering exertions of Mr. William Abbotts (the great-grandfather of the editor of *HYGIENE*), who may be regarded as the founder of modern Leamington, the cottages began to give place to large houses; and early in this century, streets, hotels, baths, and mansions followed in

quick succession. Hither, by the magic spell of a great physician, patients flocked by thousands, drank the Natural Mineral Waters, and went away cured. Who is there that has not heard of the great Dr. Jephson? He reigned supreme in Leamington for half a century and attracted invalids from all parts of the world, I may say, nobles and commoners, gentle and simple, by his extraordinary power.

The caprice of fashion, and possibly the facilities afforded for travel by steamboats and railways have drawn people away to the Continent, but we have every reason to believe there is now a backward wave in our favour.

Royal Leamington Spa, including the residential suburbs of Milverton and Lillington, with a joint population approaching 40,000 inhabitants, is situated in the middle of "leafy" Warwickshire.

The borough stands at 190 feet above the sea level, and its situation is one of great natural beauty.

Leamington is often pronounced the prettiest and cleanest town in England, and by this appellation it is well-known in the United States. It is built upon a regular plan, with wide and open streets, which in many instances are bordered with chestnut and lime trees, and these impart to the place the aspect of a German Spa.

Hygienically considered, Leamington ranks well, and for the number of its population is one of the healthiest towns in England.

It is blessed with an abundant supply of pure water, derived from an artesian well, of which it is said by Dr. Tidy that "as a dietetic water it is in every way of excellent quality, and for wholesomeness leaves nothing to be desired."

The borough has a pattern system of drainage. The sewage matter is pumped up to a farm, situated some miles from Leamington, and is considered a model of its kind. The sewers have numerous ventilators and are frequently flushed, thus insuring a healthy sanitary condition of the houses. All these matters of detail help to make it a high-class health resort; and



when I say that the death-rate from all causes for the last three years averaged only 15·24 per 1,000, and that from zymotic diseases during the same period 1·1, I think it will bear favourable comparison with other inland watering places of equal population.

The climate and temperature of Leamington may be described as equable, and not subject to great extremes. The annexed tables of comparison will give the reader an excellent idea of its general meteorological bearings. They embrace a period of ten years and are chiefly taken from Symons' "British Rainfall."

METEOROLOGICAL TABLE.

| Places              | Inches | Rainy Days | Observers                                                                  |
|---------------------|--------|------------|----------------------------------------------------------------------------|
| Leamington ...      | 30·2   | 176        | Jones, Whish, Field, Barnitt.                                              |
| Great Malvern ...   | 32·1   | 168        | Sandoe, Palmer, Mann                                                       |
| Cheltenham ...      | 32·3   | 172        | Mackgill, Landsboro, Kay, Humphries, Kynaston, Tyrer.                      |
| Harrogate ...       | 33·5   | 161        | Coupland.                                                                  |
| Tunbridge Wells ... | 34·0   | 158        | Miller, Townshend, Winton, Brentall, Buchanan, Siemens, Royal Meteor. Soc. |
| Bath ...            | 35·3   | 180        | Barter, Russel, Stokes.                                                    |
| Clifton ...         | 39·1   | 177        | Burder.                                                                    |
| Ilkley ...          | 39·9   | 200        | Dymond, Ha'nsworth, Call, Scales, Richardson.                              |
| Matlock Bath ...    | 41·2   | 176        | Chadwick.                                                                  |
| Buxton ...          | 53·4   | 196        | Sykes.                                                                     |
| Average ...         | 37·1   | 176        |                                                                            |

|                 | Deg. Fahr. |
|-----------------|------------|
| Buxton...       | 45·2       |
| Leamington ...  | 48·0       |
| Cheltenham ...  | 48·3       |
| Clifton ...     | 48·7       |
| Torquay ...     | 49·8       |
| Bath ...        | 50·3       |
| Bournemouth ... | 50·3       |
| Llandudno ...   | 50·5       |

Dr. Loudon writes :—" Leamington, through being situated at a distance from the coast, and in the midst of a level country, is exposed neither to sudden gusts of wind nor to frequent rains, which a mountainous neighbourhood so constantly attracts. The temperature is more equal than that of the greater part of the inland watering-places in the country. The highly

cultivated state of the soil around the town, entirely free from morasses, with the numerously scattered woods and rivulets, contributes to its being one of the most salubrious spots in the inland counties."

The climate of England is well-known to vary and to be uncertain, no matter in what part people live. That of Leamington will seem, from the foregoing tables and quotation, to be one which well admits of its being a place of permanent residence. The fact that it has become so speaks for itself. And certainly, so far as taking a course of the saline waters goes, this may be begun and carried on at any time of the year, which cannot be done in the more northern spas of Scotland and England, or in nine-tenths of the Continental ones.

Dr. Hermann Weber, who is the greatest living authority on mineral spas, observes : " We can see no reason why Leamington should not again become a much frequented and useful watering place, the more so as in many instances it may be resorted to *in early autumn or even winter*, on account of its great mildness of climate compared with Continental spas." Although in the spring, summer, and early autumn, patients look for most benefit because they can bathe without the same risks of taking cold, still, there is no doubt but that more come to Leamington in the winter now than formerly for " courses " of the mineral water and for the baths. It is seldom they cannot find three or four days in a week genial enough to bathe in and in this respect it is more like Bath than any other of the British watering places.

I have had an analysis made of all the mineral waters at present in use at the Royal Spa, but as all are saline and more or less alike, I think my object will be gained by giving that of two—namely, the Pump Room, and the Chalybeate Wells.

The following is an analysis of the *Pump Room Well*, by Dr. Meymott Tidy, Professor of Chemistry and Public Health, at the London Hospital, and Analyst for the City of London.

|                         | Grains per pint. |
|-------------------------|------------------|
| Sodium... ..            | 35.35            |
| Magnesium ... ..        | 2.33             |
| Calcium ... ..          | 7.52             |
| Chlorine ... ..         | 56.15            |
| Sulphuric Acid ... ..   | 25.05            |
| Peroxide of Iron ... .. | .25              |
| Silica ... ..           | .14              |
|                         | <hr/>            |
|                         | 127.79           |

*Chalybeate, the Public Fount.*—Analysis made by Professor Brazier.

Chief gas is carbonic, with small quantities of oxygen and nitrogen. Alkalinity expressed as carbonate of calcium is equivalent to 1.12 per pint:—

|                               | Grains per pint. |
|-------------------------------|------------------|
| Sodium ... ..                 | 32.67            |
| Magnesium ... ..              | 1.53             |
| Calcium ... ..                | 5.18             |
| Chlorine ... ..               | 45.12            |
| Sulphuric acid... ..          | 25.74            |
| Carbonate of Iron ... ..      | 1.01             |
| Carbonate of Calcium ... ..   | .67              |
| Carbonate of Magnesium ... .. | .03              |
| Silica ... ..                 | trace.           |
|                               | <hr/>            |
|                               | 111.95           |

By combination, the following salts are distributed in these wells in varying proportion:—

|                         |           |
|-------------------------|-----------|
| Chloride of Sodium.     | } Traces. |
| Sulphate of Sodium.     |           |
| Sulphate of Magnesium.  |           |
| Sulphate of Calcium.    |           |
| Chloride of Calcium.    |           |
| Carbonate of Calcium.   |           |
| Carbonate of Iron.      |           |
| Chloride of Magnesium.  |           |
| Carbonate of Magnesium. |           |
| Bromide of Sodium.      |           |
| Chloride of Potassium.  |           |
| Carbonate of Sodium.    |           |
| Lithium.                |           |

We have, in these waters, mineral salts which we can recommend as powerful remedies in the cure of certain diseases. They are such that we can, with a great amount of certainty, explain their action, a matter of much importance with regard to mineral waters. The Leamington waters have a fixed strength, and we are thus enabled to prescribe them with accuracy, a statement which cannot be made of all mineral waters. It will be observed, on looking at the analysis, that the bases of the salts seem to tend in one direction so far as the diseases go for the relief of which they are indicated. The chief bases—sodium, calcium, and magnesium—are all alkalisers of the blood,

and as such are most useful in gout, rheumatism, gravel, and in a disordered state of digestion arising from excess of acidity.

Taken warm at the source, in the early morning, in quantity from ten to twenty ounces, succeeded by a gentle walk, and it may be a cup of tea or breakfast—the effect upon most people is a smart liquid purge, with a feeling of relief of weight from the abdominal cavity. When taken in less quantity (and it may be diluted with drinking water) the action is more of a diuretic kind. The “all-round” action, therefore, of Leamington salines is purgative and diuretic; they are alkalisers and general blood purifiers. In dealing with a few of the diseases in which I find them most beneficial, I will, in as few words as this short paper will allow, run over the principal heads and modes of action in each. Take irritative dyspepsia, where there are fermentations of acids in the stomach, with constipation, eructations of gases from the same organ, palpitation of the heart, and other disturbances.—the Leamington salines remove matters from the alimentary canal that are a source of irritation; they prevent an accumulation of such matters as produce disturbances in other organs; and they likewise neutralise the ferments of indigestion, and remove excesses by purgation and diuresis. In congestion of the kidneys they are most valuable. Independently of the “communications” anatomically, by which the kidneys may be relieved by purgation through the portal circulation, there is a much more important physiological relation between the two excretory organs (bowels and kidneys); for, if the Leamington salines fail to purge, or purge but in part, they pass on to the kidneys, and act as powerful diuretics. They are chiefly alkaline in their influence on the blood and urine, but are also independently active as specific renal stimulants. In congestion of the liver, a course of the Leamington salines relieves the engorged portal circulation, which lies at the circumference and between the lobules of



the liver. At the same time, doubtless, some of the salts are absorbed into the blood, and excreted by the kidneys, which they powerfully stimulate, and thus open up the urinary discharge, which is the second great channel of relief to the liver. In gout, when it has become chronic, Leamington salines are most beneficial. The excesses of urates and uric acid in the blood are eliminated from the system by a well-directed course of the mineral waters. In this way gout is relieved, and in many cases for the time cured, by the uric acid being alkalisied by the sodium, magnesium, and calcium salts, and by the channel of excesses being diverted through the bowels and kidneys. In the same way chronic cases of rheumatism are relieved and cured when ordinary remedies have failed.

Sciatica, when mixed up with the gouty or rheumatic diathesis is frequently cured by these mineral waters—so, too, eczema, psoriasis, and many other skin diseases. In cases also of anemia I have seen the most marvellous benefit derived by their use and the addition of some preparation of iron to the Chalybeate water. It has the effect, almost in every case, of emptying the bowels of fecal matter, improving the digestion, and leaving the tissues of the body in a healthier condition. In addition to the aperient effect generally, and the blood-globule-giving power of the carbonate of iron, the chlorides (which are largely present) seem to me to stimulate the construction of anæmic tissues as a whole, and retard retrograde metamorphosis.

Space will not allow me to explain how hæmorrhoids, pelvic congestions, struma, climacteric disorders, paralysis of some kinds, and degeneration of tissues and vessels, all more or less find antidotes in these salines. But such is the case.

*The Baths.*—During the last twelve months the bathing accommodation at the Pump Rooms has been vastly improved. The committee, acting on advice given them by me

in the winter of 1884, resolved to renovate the baths and add new ones where necessary. This work has been admirably carried out by our intelligent Borough Surveyor, Mr. Norminville, and the baths are, for their size, everything that one can desire.

The various kinds of baths are reclining baths; deep immersion baths, with lift-crane and chair, for invalids and those who cannot walk; needle baths of newest designs; local and special douche baths; ascending and descending douches, and wave baths; vapour and shower baths; a beautiful Turkish bath; and large tepid swimming bath 70 feet by 30 feet.

In conclusion, I think it will not be out of place to let intending visitors know that in Leamington will be found every kind of accommodation suited to their wants—spacious and comfortable hotels, lodging-houses, sunny, well-appointed, and clean—to say nothing of noiseless and easy bath-chairs, and all manner of invalid appliances. For those who are well enough to enjoy out-of-door exercise, there is all through the winter months the noble sport of fox-hunting, which they may follow to their hearts content. Leamington has for many years been the rendezvous of “mighty hunters.” The country round, too, is fertile, undulating, and abounding with objects of the greatest historical interest, for within easy access are Shakespeare’s birthplace, home, and final resting-place at Stratford-on-Avon; Warwick Castle, one of England’s noblest piles; Kenilworth Castle, a stately ruin associated with royal gatherings, silent gondolas, splendid tournaments, gorgeous banquets, and burly round-heads; and other places of equal historical interest, such as Edgehill, Stoneleigh, and Coventry with its three church spires.

The accompanying table, showing the comparative composition of the Leamington waters, with those of similar saline and carbonated saline waters in some of the popular German and French spas (expressed in grains per pint), will be found useful.

COMPARATIVE TABLE OF THE COMPOSITION OF THE LEAMINGTON AND OTHER MINERAL WATERS.

| SPA.                              | SOURCE.                     | Sodium Chloride. | Magnesium Chloride. | Calcium Chloride. | Sodium Sulphate. | Calcium Sulphate. | Magnesium Sulphate. | Calcium Carbonate. | Magnesium Carbonate. | Iron Peroxide. | TOTAL. |                                                                                           |
|-----------------------------------|-----------------------------|------------------|---------------------|-------------------|------------------|-------------------|---------------------|--------------------|----------------------|----------------|--------|-------------------------------------------------------------------------------------------|
| Leamington ...                    | Pump Rooms...               | 84.8             | .49                 | —                 | —                | 20.66             | 7.44                | .78                | .04                  | .08            | 114.3  | With traces of bromide of sodium, chloride of potassium, carbonate of sodium and lithium. |
| ...                               | Grove's Well ...            | 92.01            | 1.02                | 1.85              | —                | 21.87             | 11.52               | 1.53               | —                    | .25            | 120.96 |                                                                                           |
| ...                               | Aylesford Well ...          | 68.63            | —                   | —                 | 12.82            | 17.58             | 7.20                | .39                | .15                  | .05            | 106.82 |                                                                                           |
| ...                               | Public Fount... ..          | 74.35            | —                   | —                 | 10.63            | 17.61             | 7.65                | .67                | .03                  | 1.01           | 111.95 |                                                                                           |
| Marienbad ...                     | Kreuzbrunnen (Bohemia) ..   | 10.32            | —                   | —                 | 47.55            | —                 | —                   | 4.98               | 4.16                 | .33            | 85.13  |                                                                                           |
| Taraspol ...                      | Gt. Spring (Lower Engadine) | 36.70            | —                   | —                 | 20.67            | 3.77              | —                   | 22.36              | 9.60                 | .25            | 141.55 |                                                                                           |
| Franzensbad ...                   | Salzquelle (Bohemia) ...    | 11.25            | —                   | —                 | 22.50            | —                 | —                   | 2.86               | —                    | .02            | 47.81  | With bicarbonate of sodium in varying proportions.                                        |
| Elsler ...                        | Marienbrunnen (Saxony) ...  | 17.87            | —                   | —                 | 28.25            | —                 | —                   | 1.37               | —                    | .43            | 55.03  |                                                                                           |
| Rohitsch ...                      | (Styria) ... ..             | —                | —                   | —                 | 18.75            | —                 | —                   | 13.75              | 11.25                | .07            | 51.32  |                                                                                           |
| Baden ...                         | ... ..                      | 2.48             | 2.01                | —                 | 2.65             | 7.06              | —                   | 1.62               | —                    | —              | 17.46  |                                                                                           |
| Kissingen ...                     | Ragozci (Bavaria) ... ..    | 55.88            | 2.41                | —                 | —                | 3.73              | 5.62                | 10.17              | —                    | .30            | 81.54  |                                                                                           |
| ...                               | Pandur ... ..               | 52.98            | 2.02                | —                 | —                | 2.87              | 5.73                | 9.73               | —                    | .25            | 76.94  | With small quantity of chloride of lithium.                                               |
| ...                               | Maxbrunnen ... ..           | 21.90            | .63                 | —                 | —                | 1.32              | 2.27                | 5.77               | —                    | —              | 33.31  |                                                                                           |
| Homburg ...                       | Elizabethenbrunnen(Nassau)  | 94.6             | 7.0                 | 6.6               | —                | .12               | —                   | 14.5               | .25                  | .22            | 126.49 | With chloride of potassium.                                                               |
| ...                               | Kaiserbrunnen ... ..        | 68.8             | 4.0                 | 5.25              | —                | .12               | —                   | 8.8                | .37                  | .22            | 89.86  |                                                                                           |
| Wiesbaden ...                     | (Nassau) ... ..             | 65.61            | 1.85                | 4.5               | —                | .86               | —                   | 4.01               | —                    | .05            | 78.30  |                                                                                           |
| Soden ...                         | (Nassau), Milchbrunnen      | 22.1             | —                   | —                 | —                | .24               | —                   | 3.41               | 1.71                 | .20            | 29.32  |                                                                                           |
| ...                               | Warmbrunnen ... ..          | 32.65            | —                   | —                 | —                | .31               | —                   | 3.58               | 3.28                 | .37            | 44.1   | With chloride of potassium.                                                               |
| ...                               | Wilhelmsbrunnen             | 130.1            | —                   | —                 | —                | 1.22              | —                   | 10.47              | 1.60                 | .37            | 147.4  |                                                                                           |
| ...                               | Soolbrunnen ... ..          | 143.0            | —                   | —                 | —                | .95               | —                   | 10.78              | .36                  | .75            | 161.97 |                                                                                           |
| Arnstadt ...                      | ... ..                      | 32.62            | .62                 | —                 | 1.90             | 4.05              | .90                 | 1.25               | .05                  | —              | 41.42  |                                                                                           |
| Bourbon Lancy (Saône-et-Loire)    | ... ..                      | 11.37            | 3.5                 | .43               | 2.18             | .17               | —                   | .52                | 1.31                 | .17            | 19.82  |                                                                                           |
| Bourbonne-les-Bains (Haute-Marne) | ... ..                      | 50.57            | 3.5                 | —                 | —                | 7.70              | —                   | .87                | —                    | .02            | 66.22  |                                                                                           |
| Salins-Mouliers (Savoie)...       | ... ..                      | 99.02            | —                   | —                 | 5.6              | 12.18             | 6.58                | 8.79               | —                    | —              | 132.48 |                                                                                           |
| Brides-les-Bains (Savoie)         | ... ..                      | 10.69            | —                   | —                 | 9.02             | 20.56             | 6.12                | 2.84               | —                    | .14            | 49.73  |                                                                                           |



## VEGETARIANISM FROM A THERAPEUTIC POINT OF VIEW.

BY PROFESSOR DUJARDIN-BEAUMETZ, Member  
of the Academy of Medicine, Physician to  
the Cochin Hospital, Paris.

[Abstract of a lecture delivered at the Cochin  
Hospital, Paris.]

THE subject which I have chosen for this lecture is one of utmost importance in connection with the question of the application of diet to the treatment of disease. I hope to show that if vegetarianism is not adapted to the healthy man and to our climate, a vegetable diet may, nevertheless, be most appropriate in a large number of affections of the stomach and kidneys. This subject has, moreover, given rise to numerous disputations, the literature of which would constitute a library by itself. I will call attention particularly to an interesting essay by Algernon Kingsfordt, and the larger work since published by Edmond Pivion on the same subject.\*

To decide this question, we must appeal successively to physiology, anatomy, and anthropology.

By the structure of his digestive tube, by the conformation of his teeth man naturally finds his place in the group of omnivorous animals, and it is by virtue of this ability to subsist on all kinds of food that human beings can live in all climates. Carnivorous in cold countries, man becomes vegetarian in warm climates.

This question of climate does not seem to have had the importance assigned to it which it deserves in the numerous discussions which have arisen in reference to vegetarianism, and I fear that writers have overlooked the wide differences which exist between the conditions of man inhabiting tropical regions and those of man living in the temperate and frigid zones.

We find the Englishman, a meat-eater *par excellence*, who derives from this regimen great advantages when he lives in his own country, become sick under the influence of this same alimentary regimen when he inhabits the torrid zone, as India, where he is forced to become, to some extent, vegetarian if he would keep in health.

Let us see now what data are furnished by physiology and anthropology.

It is certain that, according to the climates in which he lives, man may find in a purely vegetable diet all the elements necessary to engender force and substance, and it is a mistake to affirm that an animal diet is absolutely indispensable for the production of force. Is it not from animals strictly herbivorous—the horse and the ox—that we obtain the greatest sum of muscular work? And the Hindoo, the Chinese, the Tonquinese, who live exclusively on rice, are able to do an amount of labour equal and even superior to that performed by the working men of the countries of the north who live on meat.

Moreover, we may affirm that the greater number of the inhabitants of the globe, whether by necessity or in consequence of their religion, subsist on a vegetable diet; but when we come to the countries in the frigid and temperate zones, we easily find proof that the introduction of meat into the diet of the labouring man augments the production of his work.

In a work devoted to the subject Dr. Kingsfordt enumerates at some length the different regions of the habitable globe where the people live exclusively on vegetable food, and remarks that in the northern countries the lower classes are mostly vegetarian. The fact is too true, and we see still, in France, multitudes of our day-labourers in the country living on a daily fare in which meat constitutes hardly any constituent. But such writers as Kingsfordt forget that this kind of diet is imposed on the labouring classes by the poverty and misery of their situation, and, certainly, the Irishman,

\* Algernon Kingsfordt, "Alimentation Végétale chez l'Homme" (Végétarisme, *Thèse de Paris*, 1880); *La Réforme Alimentaire*, January, 1887.

who lives mainly on potatoes, would be very glad to eat meat if he could get it. What it is necessary to show is not the possibility of living on a vegetable diet in our climate, which is not under dispute, but that a vegetable diet from the point of view of the production of work is superior to a diet containing, in addition, a certain quantity of meat. Here statistics are in blank contradiction to the contention of the vegetarian, and in proportion as in our country-places the alimentary ration is improved by the addition of animal food in larger quantity, the health of the people is made better and the production of work is augmented, and this is especially perceptible in our great industrial establishments, mines, and ship-yards.

Moreover, the history of mankind goes to show that, from the very origin of the human race, man has been able to adapt himself to the climates in which he has lived by reason of this very fact that he is an omnivorous animal. The primitive man, before he had come into possession of the weapons of offence, which enabled him to subjugate and kill the animals around him, must have been strictly a vegetarian, but when once he learned to use arms and weapons of destruction, he became carnivorous, and the troglodyte cooked over the fire, which he kept ever burning before the door of his cave, the morsels of the reindeer which he had killed in the chase. The necessity of using a flesh diet was imposed upon him by the rigorous climate in which he lived. Our country was then undergoing the rigour of the glacial period, and the reindeer and the bear lived here (in France) in abundance.

On the other hand, in warm countries man could fare very well without meat. In India, that cradle of the civilisation of Indo-European races, we see the vegetarian regimen prescribed by the prevailing religion, and we find in the books of the law of Manu sentences like the following:

"He who, in conformity to the law, refuses

to eat meat, vampire-like, is beloved in this world, and is not afflicted by diseases."

One of the reformers of the religion of Brahma, who died B.C. 600, Buddha-Gautama or Sakya-muni, condemns absolutely the usage as food of everything that has had life. It is the same in China, where Buddhism, which was introduced about A.D. 64, proscribes animal food.

We see this proscription repeated by the great philosophers and reformers, who all appear to be struck by the evils resulting from excesses in eating, and especially from excesses in animal food, and this is noticeable even in the fabulous periods of our history. Homer extols the lotophagi who lived on milk and fruits. He contrasts the ferocity of the Cyclops—eaters of flesh—with the mildness of manners of these eaters of the lotus.\*

The history of Prometheus gives also the same idea. Prometheus steals fire from heaven in order to make unwholesome viands palatable, and everybody knows what was the penalty of the theft.

But it is to Pythagoras, of Samos, who lived B.C. 608, that the honour belongs of having established the vegetarian regimen, which has since been also called the regimen of Pythagoras. Nevertheless, Pythagoras's dietary was far from presenting the severity which has since been attributed to it, for Pythagoras did not absolutely prohibit meat, but allowed his followers "to eat the flesh of young and tender animals."

Socrates and Plato held and taught the same notions, and, in Plato's "Republic," Socrates makes the inhabitants of his island vegetarians; hence his interlocutor Glaucon, who seems to believe in more substantial fare, makes this reply, after hearing the account of

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\* "Not prone to ills, nor strange to foreign guest,  
They eat, they drink, and nature gives the feast;  
The trees around them all their food produce;  
Lotos the name, divine, nectareous juice."

Pope's *Odyssey*, Book IX.



the frugal vegetarian meal enjoyed by the inhabitants of this ideal republic: "If you were organising a State of swine, would you feed them a whit differently?"

These same vegetarian doctrines crop up in almost all the ancient philosophers—Seneca, Plutarch, and others. It is the same with the fathers of the Church, in whose writings one might point to scores of passages which show that the ascetic regimen was followed by a great number of these fathers; passages which Balzer, a clergyman, has collected into a volume, which bears the somewhat strange title of "Vegetarianism in the Bible." Thus it is that St. Chrysostom, St. Jerome, St. Basil the Great, St. Clement of Alexandria, St. Gregory of Nazianze, and St. Augustine, extol temperance, and, in particular, vegetarianism, and we have still further a proof of the favour extended by the Church to vegetarianism, in the almost absolute vegetable diet to which certain religious orders—as the Carthusians and the Trappists—are subjected.

In times much nearer our day we see also the same views carried out, and I will cite, for instance, a dean of the Paris Faculty in 1709,—Hecquet. Hecquet, who was one of the most vehement advocates of blood-letting, and served as a type to Lesage for his Doctor Sangrado, was also an earnest advocate of vegetarianism.

About the same epoch—1760—there was a noted English physician who was a convert to vegetarianism—Dr. Cheyne. Cheyne, who, like Hecquet, condemned, as contrary to the normal state, the eating of flesh, wrote as follows:

"I take for my food milk, tea, coffee, bread and butter, salads, cheese, fruits, and cereals of all kinds, potatoes, turnips, carrots. In a word, I eat everything which has not had animal life; these foods afford me a greater variety than a flesh diet. I drink no wine or other liquids, but I rarely am thirsty, for my food is for the most part liquid or succulent. I am always gay and in good trim, and my sleep is sweeter and more sound than when I used to

eat meat; for with my present diet I am more active. I rise at six o'clock in the morning, and go to bed at ten p.m."

I should make this lecture far too long if I were to mention all the noted men who have followed the vegetarian doctrine. Thus I need hardly remind you that Voltaire praised vegetarianism, and in his writings points out all the advantages which may be derived from a vegetable diet.

Rousseau descants at length on this subject, and in the annotation which he has made to the article of Plutarch on "Kreophagy," he described the first meal at which barbarian man partook of animal flesh in emphatic, if not very poetic, lines. Cuvier, Buffon, Monthyon, Menard, and others of the same epoch were vegetarians.

But these are, I repeat, exceptional instances, at least in our climate, and no large body of people has ever been persuaded to adopt these views, notwithstanding all the efforts of the various vegetarian societies.

These societies had for their founder Gleizes, who published in 1840 a work entitled "Thalysie, or the New Existence."\* This was the starting-point of all the associations called vegetarian, many of which now exist in America and in England. In the latter country the most important of these societies is the "National Food Reform Society." At Hamburg there are also similar societies. In France we have the Vegetarian Society. I must also mention the very active part taken recently in the vegetarian campaign by a vehement partisan of this dietary system—Dr. Bonnejoy, of Vexin† (President of the French Vegetarian Society).

All these societies have placed themselves for the most part on a sentimental basis laid down by Gleizes himself, who writes in this manner:

\* Gleizes, "La Thalysie, ou la Nouvelle Existence," in three volumes, 1840-42.

† Bonnejoy, of Vexin, "The Rational, Scientific Vegetarianism." Bordeaux, 1889.

"The murderous slaughter of animals is the principal source of the cruelty of man and of his crimes, as the habit of feeding on their flesh is the primary cause of his ugliness, of his diseases, and of the short duration of his existence." And in a letter which Dr. Gayard wrote to me on this subject I find the following passage:—"Vegetarianism is less a scientific question, in the strict sense of the word, than a social, and especially a moral, question. The true domain of the question is that of conscience—*i.e.*, of the moral umpire within us. The supremacy of this inward monitor—the true *ego*—is not acknowledged by all; in gross or depraved natures it is kept out of sight and in abeyance. The practice of vegetarianism is one of the best methods for restoring that supremacy; in other words, for rendering more sensitive the moral sense."

The same idea is advocated by one of the most energetic partisans of vegetarianism—Dock, of St. Gall—who regards vegetarianism "as a regimen at once the most natural, the most human, the most moral, the most æsthetic, the most wholesome for the body and for the soul, and the most economical."\*

But we are not called upon here to concern ourselves with vegetarianism from a social and religious point of view, and we will now take up the pathological and therapeutic aspect of the question.

What impressed all the physicians of antiquity was the evils attending the excessive ingestion of food; and all who have since then

practised medicine have remarked these evils. As a general thing, the rich and the idle eat too much, and the daily ration much exceeds the standard amount fixed by physiology to repair the wastes of the organism, a waste estimated, as you know, at twenty grammes of nitrogen and 310 grammes of carbon for the twenty-four hours. Already, in my "Alimentary Hygiene," I have insisted on this point.

It would appear that in many pathological states a vegetable diet is indicated; and it now remains to determine how we should regulate and prescribe this vegetarian regimen.

First, we must settle upon this important point,—that a vegetable diet may suffice for alimentation. This fact is incontestable, since, even in our own climate, we see the poor inhabitants of entire country districts maintain their health and strength on this exclusive regimen. Moreover, we have analyses to show that man may find in vegetables alone the quantity of nitrogen necessary for his support.

In fact, most starchy and leguminous vegetables contain a certain quantity of nitrogen. Glance over the following table by Payen, and compare the proportion of nitrogen, fatty matters and carbon, in the different aliments which make part of the vegetarian regimen, and it will be seen that we have in all of them nitrogen in greater or less quantity. It is easy to understand that we may associate these different foods in such a manner as to constitute an alimentary ration comparable to the regimen of meat-eaters.

|                                | Nitrogen. | Carbon. | Fats. | Water. |
|--------------------------------|-----------|---------|-------|--------|
| Butcher's meat .. .. .         | 3.00      | 11.00   | 2.00  | 78.00  |
| Eggs (white and yolk) .. .. .  | 1.90      | 12.50   | 7.00  | 80.00  |
| Cow's milk .. .. .             | 0.66      | 7.00    | 3.70  | 86.50  |
| Goat's milk .. .. .            | 0.69      | 7.60    | 4.10  | 83.60  |
| Brie cheese .. .. .            | 2.25      | 24.60   | 5.56  | 58.00  |
| Gruyère cheese .. .. .         | 5.00      | 36.00   | 24.00 | 40.00  |
| Chocolate .. .. .              | 1.52      | 48.00   | 26.00 | 8.00   |
| Beans .. .. .                  | 4.50      | 40.00   | 2.10  | 15.00  |
| Haricot (kidney) beans .. .. . | 3.88      | 41.00   | 2.80  | 12.00  |
| Lentils .. .. .                | 3.75      | 40.00   | 2.65  | 12.00  |
| Peas .. .. .                   | 3.50      | 41.00   | 2.10  | 10.00  |
| Hard southern wheat .. .. .    | 3.00      | 40.00   | 2.10  | 12.00  |
| Tender wheat .. .. .           | 1.81      | 39.00   | 1.75  | 14.00  |
| Indian corn .. .. .            | 1.70      | 44.00   | 8.80  | 12.00  |
| Rice .. .. .                   | 1.08      | 43.00   | 0.80  | 13.00  |
| Potatoes .. .. .               | 0.24      | 10.00   | 0.10  | 74.00  |

\* Dock, "On Vegetarianism, or the Manner of Living according to the Laws of Nature." St. Gall, 1878.



Moreover, on reference to the tables which I have published in my "Alimentary Hygiene" it will be seen how easily it is for a man to find in the so-called vegetarian regimen the quantities of nitrogen and carbon which are necessary and sufficient for him, and which are fixed according to the figures of Hervé-Mangon, at from 6 to 9 grammes of carbon and from 250 to 360 of nitrogen per kilogramme of the weight of the body.\* I say in the vegetarian regimen, for most partisans of this regimen allow milk, eggs, and cheese. Here we have, then, according to Pivon, an alimentary ration as simple as possible, in which will be found the 20 grammes of nitrogen and the 310 grammes of carbon necessary to maintain life.

|                                                       | Nitrogen. | Carbon. |
|-------------------------------------------------------|-----------|---------|
| 500 grammes (1 lb.) of baker's bread containing .. .. | 6.00      | 150     |
| 500 grammes of lentils (peas or beans) .. ..          | 14.74     | 214     |
| 500 grammes (1 pint) of milk .. ..                    | 3.30      | 40      |
| 30 grammes of Gruyère cheese .. ..                    | 1.65      | 13      |
| 1530 grammes.. ..                                     | 25.69     | 417     |

Among the foods utilized by the vegetarian regimen, there are some that are highly azotized; and, without speaking of eggs and cheese, I might insist particularly on certain amylaceous products, as lentils, peas, and beans. In my "Alimentary Hygiene" I have shown that the lentil contains a large quantity of azotized products, and, moreover, a notable quantity of iron, more even than is contained in meat. Moreover, none of the starchy foods is deprived of nitrogen. It has, indeed, been maintained that the manioc, on which the Indians subsist who inhabit the banks of the Orinoco, does not contain nitrogen. This is an evident mistake. In an analysis which has been furnished me by Dr. Morel, assistant professor at the School of Toulouse, it is shown that 100 grammes of manioc flour give 22.40 grammes of

starchy matters and 9.65 grammes of azotized matters.

But I must speak here more especially of the new amylaceous products,—soja, fromentine, and legumine,—which are proved to be superior, as you will see, to meat itself, in the proportion of nitrogen which they contain.

The soja is the Japanese bean (*Glycine hispida*), much cultivated in certain countries of Europe, and, more particularly, in Hungary, since 1875. This bean, which contains extremely little starch, and has been employed in the dietetic treatment of diabetes by Lecerf, contains a very large amount of azotized matters; and, on referring to the different analyses published by Steuff, Capan, Pellet, and

Muntz, we find the following percentage of the alimentary principles contained in this bean.

|                       | Per cent. |
|-----------------------|-----------|
| Protein matters .. .. | 36.67     |
| Fatty matters .. ..   | 17.60     |
| Starchy matters .. .. | 6.40      |

If this analysis is compared with that of meat the following result is obtained.

|                             | Beef. | Soja. |
|-----------------------------|-------|-------|
| Water .. ..                 | 74.00 | 9.37  |
| Proteinaceous matters .. .. | 22.74 | 36.67 |
| Fatty matters .. ..         | 2.30  | 17.60 |
| Potassium .. ..             | 0.54  | 3.10  |
| Phosphoric acid .. ..       | 0.66  | 1.47  |

As shown by these figures, the Japanese bean has a decided advantage over beef.

From an alimentary point of view, soja serves several uses. A sauce is made from it which bears the name of *stiso* and *soju*; but the most curious and interesting point in the application of soja to dietetics is that a kind of cheese can be made from it, — it is the *pea* or *bean cheese*, very much prized in Japan—and, those who would like to know more about the

\* Dujardin-Beaumetz, "Hygiène Alimentaire," 2nd ed. p. 115.

fabrication of this cheese will find all the information they desire in the article of Egasse, "On the Economic and Therapeutic Applications of Soja," in the *Bulletin de Thérapeutique*, vol. cxv, p. 133.

In Europe the soja has been utilized for the food of men and animals, and in the last few years the attempt has been made to make bread of it, which is a matter of considerable difficulty by reason of the large proportion of oil which this bean contains. This oil, as Léon Petit has shown, is very purgative, and might replace castor oil in medical practice. Hence it becomes necessary to rid the meal of this oil in order to render it fit for domestic use. Lecerf in Paris, and Bourdin in Rheims, have succeeded in rendering the bread fabricated from this meal very well borne by the stomach.

Here, then, we have a bean which is more nutritive than meat, and which serves for nourishment to a great country like Japan under the different forms of sauce, of cheese, of farina, and even of a real artificial milk. You will see all the advantage which the vegetarian regimen may derive from such a food.

Fromentine is also a highly azotized product; it is obtained from the embryos of wheat by certain new processes of grinding and bolting. These embryos contain, like the soja bean, a certain quantity of oil, which is purgative, like soja oil, and may take the place of castor oil. The analyses of these dried and pulverised embryos have given Douliot the following figures:

|                           |       |
|---------------------------|-------|
| Albuminoids ... ..        | 51.31 |
| Ternary substances ... .. | 29.08 |
| Cellulose ... ..          | 12.63 |
| Mineral substances... ..  | 6.98  |

It is a true vegetable meat; but here, as in the case of soja, the presence of the oil hinders the making of bread with this flour, and this oil must be got rid of, if the fromentine is to be used either for bread or gruel. Of this farina different culinary products are made, which are now much in use; there are biscuits and cakes of fromentine, it is much utilised also in the form of gruel or porridge. When fromentine

meal is ordered care should be taken to incorporate this meal in a certain quantity of water before adding it to milk or *bouillon* which is to serve for taking it in. Without this precaution clots, or lumpy concretions would be formed spoiling the appearance of the porridge.

Bovet has prepared, under the name of legumine, a substance similar to fromentine, and having for its basis not only the embryos of wheat but also those of the leguminosæ.

It is necessary to avoid, in the vegetarian regimen, giving the starchy grains enveloped with their hulls. Hence I always take care to order amylaceous substances in the state of *purée* or stew, to which may be added green vegetables, such as carrots, turnips, potatoes, etc.

One may also give a certain variety to the vegetarian regimen, and I know of no better examples in this regard than the bill of fare of vegetarian banquets, such as will be found in the *Réforme Alimentaire*, the organ of the vegetarians in France.\*

Under the name of *quaternaires* are comprised the quaternary aliments. As for the Graham bread, it contains all the elements of the wheat,—that is to say the flour and the

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\* We append two of these menus. In the original language (French) they read particularly appetising. What, by the way, would English vegetarians say as to wines?

## I.

*Potages*.—Lentil Soup, spring soup.  
*Hors-d'œuvre*.—Butter, radishes, olives.  
*Entrées*.—Eggs in the shell, asparagus.  
*Quaternaires*.—(i.e., containing the quaternary aliments).—Macaroni with white of egg, green peas.  
*Saccharines*.—Vanilla cream, almond rusks.  
*Dessert*.—Swiss cheese, compôte of apples, strawberry preserve, dates, oranges, gaufrettes (a kind of biscuit-cake).  
*Wines*.—Old Mâcon, Saint-Emilion, Graham bread.

## II.

*Potages*.—Crécy soup, oatmeal gruel.  
*Entrées*.—Vegetarian timbales, fresh apples in butter.  
*Quaternaires*.—Eggs mingled with asparagus tops, garden beans à la sariette.  
*Salads*.—Lettuces, and romaine of lemon juice.  
*Saccharines*.—Rice, baba, orange creams, Geneva apricot-cake.  
*Dessert*.—Cheese of various kinds, compote of bananas, gooseberry preserve, strawberries, oranges, strawberry biscuits.  
*Wines*.—Mâcon, Saint-Emilion.



bran. The vegetarians consider the presence of this bran as increasing the nutritive properties of the bread; this is a statement which cannot be admitted, for, relying on very exact analyses, I have shown in my "Alimentary Hygiene" that white bread of the first quality contains more nitrogen than bread of an inferior quality, and particularly bran bread.

In the same journal are some very curious recipes; for example, *turbot à la végétarienne* (mock-turbot), which show well that, in spite of their contention, man is more omnivorous than the vegetarians would fain admit. In the "Principles of Rational Alimentation," by Bonnejoy, of Vexin, some culinary recipes applicable to the vegetarian regimen will also be found.

Now that it is demonstrated that, by a regimen of eggs, milk, vegetables and fruits, one may find not only a sufficient dietary, but even a variety, which might satisfy the most delicate palate, it remains to consider in what circumstances we may for therapeutic ends apply this vegetarian regimen. But, first, we must discuss still another point—namely, what are the beverages which should be taken with the vegetarian diet?

From a physiological point of view, the wines augment the acidity of the gastric juice, and we know that eaters of meat are also drinkers of wine and alcohol; while, on the contrary, vegetarians ought to be water-drinkers or beer-drinkers. The beer, by the malt and diastase which it contains, favours the digestion of starches.

Hence, in England and the United States, we see the temperance societies and the vegetarian societies working hand-in-hand. I believe that, with the vegetarian regimen, one should be very moderate in the use of wine, and never take any intoxicant stronger than diluted wine, beer, or cider.

The affections of the digestive tube or of the stomach to which the vegetarian regimen is suitable are numerous.

As soon as death smites the living animal, and at the very instant when death appears, the ptomaines manifest their presence. At first non-toxic, they become toxic from the fourth or fifth day which follows death, and these substances are sufficiently deleterious to cause the death of animals to which they are administered. We find also certain of these ptomaines in ripe cheeses. As man consumes a great quantity of animal substances whose time of killing often goes back to eight or ten days, it is easy to understand what a fruitful source of poisoning may be here found; this danger is avoided by those who adopt the vegetarian regimen.

If vegetable substances may undergo putrescent alterations, these are much less likely to take place with respect to vegetable than to animal food. Hence this diet system becomes obligatory whenever, by the badly-performed functions of the kidneys or digestive tube, the toxins or ptomaines may accumulate in the economy.

In the first rank we will place all those cases where there exist renal insufficiency. Whether this insufficiency results from interstitial nephritis, from catarrhal nephritis, or from fatty degeneration of the kidneys, we should enjoin a vegetable diet. In the dilation of the stomach of gastric neurasthenia, this same regimen also gives good results.

But there is another point of view in connection with which this regimen gives good results. I refer to the irritations of the gastric mucous membrane,—acute or chronic gastritis. In fact, this regimen demands little of the stomach; the labour of digestion is imposed principally on the intestines, and the stomach is thereby given an opportunity to rest. In the so-called dyspeptic troubles, which result mostly from modifications in the gastric juice, whether this be an exaggeration or an increase in the acidity of this fluid, this dietetic system enables us to cure these affections without imposing any work on the pepsin glands. Lastly in the

general diseases characterised by hyperacidity, such as the uric diathesis, we can still derive benefit from the vegetarian regimen.

To sum up, then, and as the conclusion of this lecture, I would say, if from an anthropological and physiological point of view, man is omnivorous, and may, according to climate and according to his necessities, live on a flesh diet, or on a mixed diet, or on a vegetable diet, from a therapeutic point of view the latter regimen as applied to our climate constitutes a very important method of treatment, which is desirable in a great many gastric and renal as well as general affections.

### “OUIDA” ON WOMEN'S DRESS.

WOMEN have happily been preserved by their tailors rather than by their own good sense from the offences against taste which disfigure the modern costume of men. It is hardly possible to imagine anything better in the way of dress than the toilets which have been created by the first Paris houses for the adornment of women during the last ten or fifteen years.

Dress is, in its essence, an artificial thing. Nature has nothing to do with dress, and the blanket of the savage squaw is every whit as artificial as the Court train of the European duchess. Therefore it is senseless to object to costume as a deviation from simplicity; costume cannot be simple because it is opposed to nature; the greatest prude cannot pretend that the human form was intended by nature to be a peg on which to suspend clothes. Therefore it is a fair argument that a costume is the best which best fulfils its purpose, which embellishes the frame weighted with it, and which is so graceful, so well shaped, and so beautiful that the eyes in dwelling on it forget that it is an artificial addendum worn in deference to social prejudices and climatic necessities. Society has grown so hypercritical that it is even shy of the nude in art, to the irreparable injury to art,

and has lost sense of beauty in nudity, which is so far removed from grossness. Dress, therefore, is a trammel from which it is improbable that the human form will ever be free, and the desirable thing in it is not that it should be more or less simplified, but that it should be as delightful to the sight as it can possibly be made; and this the costumes now worn by women of fashion and by famous actresses certainly are.

That they are extremely costly is lamentable but inevitable, and it is difficult to see any possibility of cheapening them; a *femme bien mise* will always be an expensive creation of civilisation. She is an article of luxury, and must pay, or be paid for, at a very high price. If she is *très bien mise* she will make it a condition that her costume shall not be repeated for others by her *faiseur*, and this desirable monopoly in itself constitutes a most costly privilege. Yet it is not enough to go to a famous maker and give unlimited orders; any daughter of shoddy can do that, and she will be given beautiful clothes, but she will not be well dressed in them. The most beautiful and costly toilet will not make a well-dressed woman of its wearer unless it suits her form and features, and unless she is so entirely at ease in it that she thinks no more about it than if it were a bit of sackcloth, or at least so understands the *ars celare ariem* that she appears not to do so. The supreme grace of the toilettes of great French actresses is the careless way in which they wear them.

Children should be dressed as well from infancy as the means of their mothers permit; thus only can they grow up with that ease in dress and the habit of it which are essential to its effect. The dress of children should be simple, and never overladen, but it should be picture-like, and white should predominate. Nothing suits the soft lines and colours of childhood so well as white—indeed, at all ages white dress is beautiful. It is of all things the most agreeable to wear, because, as it shows



every speck of dirt, perfect cleanliness is ensured by it. Marie Antoinette preferred white gowns to those of any colour, and most women of any delicate taste will show the same preference. The dominance of black which is seen chiefly in London is an error. It gives a most gloomy aspect to concerts and parties, and nothing collects dust so rapidly. Black or grey is well worn by those women who are obliged to go about alone and on foot, because thus clad they attract little notice in the streets; but for the woman of the world, who usually drives wherever she goes, in cities, this reason for the adoption of sombre garb does not exist, and it is a fallacy to suppose that black is becoming. White clears the complexion, but black dulls it, unless, indeed, the black be black velvet, now so seldom used, yet in which everybody, male and female, old and young, dark and fair, look their best in cold weather.

The fatal folly of tight-lacing, so ruinous to the health of the woman and of her offspring, disfigures modern costume; the wasp-like waist is not beautiful: it is not harmonious; it is stiff and grotesque, and deprives the figure of all elasticity, softness and pliant undulation. No artist can tolerate, no sculptor would reproduce it. The tight semi-masculine costumes of which Englishwomen are so proud have done much to increase the wasp-waist folly; yet it may be doubted if any woman of really good taste would care to adopt these cover-coats and narrow cloth skirts; they possess no feminine grace, no artistic attribute, and give a wooden rigidity to the whole person. Englishwomen make it their boast and practice to be out of doors in all weathers, but it would not be impossible to find a costume suited to uncertain weather and country roads which would still retain something of that feminine grace of which the "tailor-made" gowns are so wholly deprived. A woman well dressed will always take care that her feet and legs are shod in conformity with her costume; stockings unlike the gown or

shoes which are unfitted to go with it suffice to destroy the whole tone of a toilet.

Englishwomen are sad offenders in this matter of *chassure*, even those of the highest rank may be often seen in drawing-rooms at five o'clock teas wearing boots or highlows only fit for the road and the field. Of all important points in a toilet the shoes and the gloves are of the greatest importance; *bien chaussé, bien gantée*, a woman will look well dressed even when wearing a very plain gown. They are both matters in which economy is a crime. Economy as you will, as you must, in all else, but never in these two items. Save in something else, but not in them, nor in your body linen. It must be confessed that a woman who has but little to spend can never be well dressed in the Parisian sense of the words. Excellence in dress, as in all other things, is only to be attained by those who can afford to disregard what has to be paid for it. There is a charm, a chic, in the confections of famous houses that can never be found outside them.

However frivolous it may sound, I would sooner have women develop their physical than their mental attractions. An ill-dressed woman, be she learned as all the ologies and all the sciences can make her, is an unsexed and unlovely thing. No woman can have herself born beautiful, but every woman may attain a certain beauty if she knows how to move and how to dress. Beyond all, fitness is the supreme necessity in all good clothes. The fisherwoman of the Sables d'Olonne, or the peasant woman of a Norman market-place, is well dressed because she has studied suitability as well as colouring; the London slattern, with her flaunting bonnet and slippers down at heel, or the Sheffield factory girl with her dingy artificial flowers and draggled ostrich feathers, is a blot on civilization, and a caricature of her sex.

**SUICIDES.**—It is estimated that there are 180,000 suicides yearly throughout the world, and that the total annual number is steadily increasing. The lowest number in any one month is in September, the highest in June. So much for the fallacy about November being the most prolific in suicides.

## ON THE EFFECT OF IMPROVED SANITATION ON THE PUBLIC HEALTH OF SEAPORT TOWNS.

By EDWARD WALFORD, M.D., D.P.H., Camb.,  
Medical Officer of Health for Cardiff.

THE sanitary arrangements of our ports, which form as it were, our first line of defence against imported epidemics, and upon which our security from invasion must greatly depend, are matters which concern the whole nation. These methods of prevention having, in our case, proved so effectual in regard to the saving of life from cholera and other allied diseases, we would fain see them adopted by other nations in lieu of the restrictive, inconvenient, and apparently useless regulations of quarantine. Practically we have long since relinquished any attempt at imposing quarantine in any of our ports, and the only remnant of this system which remains is the old Quarantine Act of George III.

In the place of resisting disease by military cordons by land and by unjustifiable detentions by sea, we rely on internal sanitation, on the provision of pure water, and efficient drainage, and on the removal of all decomposing and harmful impurities from the neighbourhood of habitations.

The town of Cardiff was at one time notorious for its heavy mortality from preventible diseases, and on the occasions of the earlier visitations of cholera to this country it suffered far more severely than the majority of English towns.

From Dr. Buchanan's well-known report on "The Results obtained by Local Authorities in their Endeavours to Improve the Public Health in their Districts," it would appear that during the epidemic of 1849, amongst the towns mentioned in this report, Cardiff, with the one exception of Merthyr Tydvil, suffered more than any other locality. Out of a population of 16,693, the deaths from cholera were 351, giving an annual death-rate of 208 per 10,000 of the population. During the same epidemic, the

cholera death-rate in England and Wales was 30 per 10,000. In the towns referred to in that report the cholera death-rate ranged from 267 in Merthyr to 1 in Leicester per 10,000 persons living. The next epidemic of cholera occurred in 1854, and caused in Cardiff 172 deaths amongst a population of 22,464, equal to an annual death-rate of 66 per 10,000 of the population as compared with 11, the death-rate per 10,000 in England and Wales. In 1866 this country was visited again with cholera, which caused in England and Wales 14,371 deaths, equal to an annual death-rate of 7 per 10,000 of the inhabitants. In Cardiff, amongst a population of 35,796, 44 deaths took place, giving a cholera death-rate of 15 per 10,000.

Summarising the above, we find that as regards England and Wales the death-rate from this disease per 10,000 persons living, which in 1849 was 30, was reduced in 1866 to 7, whilst in Cardiff the death-rate, which in 1849 was 208, was reduced in 1866 to 15 per 10,000.

In London the cholera death-rate was reduced from 51 in 1849 to 18 per 10,000 in 1866. Since this date cholera has never succeeded in gaining a footing in any part of this country, although the infection has been frequently brought to our shores. In 1884 four infected vessels came into the port of Cardiff, with cases of cholera on board, and in 1885 five cases were imported into the district. These cases were dealt with in accordance with the Cholera Regulations of the Local Government Board, and no further cases of the disease arose.

Turning now to another disease, which, in point of accusation is closely related to cholera, it would seem that the same measures which prevailed against cholera have been equally useful in protecting the community against enteric fever. Doubtless the same unwholesome local conditions which produced so heavy a mortality from cholera in former years assisted in the development of enteric fever. The disease was certainly at one time excessively fatal, as



shown by the average annual death-rate during the ten years 1845-54, which was 19 per 10,000 of the population. This rate was reduced to 3 per 10,000 in the decennial period 1874-83. The death-rate from enteric fever in England was reduced during the same period from 11 to 3 per 10,000. Now what were the local circumstances which co-operated to produce this progressive immunity from these diseases? It is stated on 'good authority that cholera prevails in excess on the margins of rivers, where there are large seaport towns having aggregated, badly housed, immoral, and closely packed populations, that it selects low, wet, sodden, and corrupt sub-soils occupied by a dense population. Cardiff at one time undoubtedly presented some, if not all, of these characteristics. In the year 1849, at the time of the first visitation of cholera of which we possess any reliable information, its sanitary condition was as bad as possible.

The water supply was derived from shallow wells, and was grossly polluted with excremental filth which percolated from cesspools and privies; no proper system of sewerage was in existence, and no removal of domestic refuse was attempted. The roads were not macadamised, courts and alleys were dirty and crowded, the atmosphere and the soil generally were in an unwholesome and polluted condition. A large immigration of paupers from Ireland had taken place in the previous year, and overcrowding, with its attendant evils, was frequent. The second epidemic in 1854 occurred before sufficient time had elapsed for the completion of any public sanitary works, but on this occasion the use of polluted well water was, as far as possible, prohibited in those districts chiefly affected, and a temporary supply of filtered river water substituted; a certain amount of street cleansing was undertaken by the sanitary authority at the time.

Between this and the time of the next visitation of cholera, in 1866, very considerable changes had been effected in the state of the

district; probably the most important of which was the construction, in 1857, of public water-works, and the constant supply of pure water. In 1855 the first section of a general sewage scheme was completed, and before the year 1860 the greater part of the town was sufficiently sewered, and the majority of cess-pools were abolished. Shortly after this a regular system of scavenging was adopted, common lodging-houses were registered and supervised, nuisance by-laws were enacted and enforced, and, generally, the sanitary administration of the district was perfected. On the occasion of each epidemic of cholera the mortality fell chiefly on those localities in which the insanitary condition was most marked; the disease in preference selected houses and districts placed on the lowest and most unwholesome site occupied by the poorest and dirtiest of Irish labourers, which had in 1848 been visited by an epidemic of typhus fever. Generally, the effect of improved sanitation in this town may be shown by the fact that the general death-rate, which in the 10 years ending 1854, with a population of 20,000, was 327 per 10,000, was reduced in the 10 years ending 1889, with a population of 130,000, to 197 per 10,000, and that the death-rate from the chief infectious diseases was reduced from 98 to 31 per 1,000 during the same period. Similar, and in some cases, doubtless, better, results have followed the efforts of local authorities throughout the kingdom to improve the sanitary condition of the districts within their jurisdiction. But whilst the improved sanitary administration of our urban and rural districts has of late years so greatly benefited the public health, practical hygiene, as applied to our floating population, has, I think, in some respects hardly kept pace with modern scientific knowledge. May not this be due, to some extent, to a system which divides the responsibility as regards health matters between three different public bodies? The Customs, the Board of Trade, and the local authorities have respec-

tively sanitary functions devolving upon them which might, I would submit, be more efficiently performed by one undivided authority. The disadvantage of this division of labour becomes apparent on the perusal of the reports on the sanitary survey of port and riparian districts by the inspecting officers of the Local Government Board, wherein we find it recorded that "a notable number of authorities, some of them acting for districts with a considerable amount of shipping trade, were found to have done nothing in the way of inspection of vessels, and that the riparian authorities generally have taken no means to ensure the wholesome condition of vessels." Here we find that one of the most important functions of a sanitary authority was entirely neglected, the inspection of shipping, by which means only a prompt detection of the presence of infectious diseases was to be expected, was not attempted, for the most part probably because these authorities did not recognise their responsibility, or because they considered that this was a matter which concerned the Customs authorities only. Then again, it must be admitted that the question of ventilation is not on such a satisfactory footing on shipboard as on land. What can be more illogical than to allow a cubic space of seventy feet as sufficient for a sailor in his sleeping apartment, and to require five times that amount for him when he resorts to the boarding-house?

Another weak point in our coast defences against disease may be mentioned. Perhaps there is no question of greater importance with regard to the shipping than that of the water supply, and yet it would seem that the Legislature has generally provided no means by which a local authority can compel the master of a ship to empty and cleanse his polluted water tank, and take on board a pure supply of water. In the case of some port sanitary authorities special powers have been conferred for this purpose by the Local Government Board, but generally the Public Health Act gives no such

powers. I am not aware that any great practical inconvenience has resulted in consequence of this legal disability; but this is due doubtless to the good sense of shipowners and masters, who usually manifest the utmost willingness to carry out the reasonable recommendations of sanitary authorities.

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### PATENT MEDICINES.\*—No. 10.

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#### BEECHAM'S PILLS.

AN old Scotch proverb runs as follows:—"There is but one good wife in the world, and every man thinks he has her." This is a curious proverb, which, like most of its class, admits of a double rendering; for, either good wives must be a rare commodity, or Scotch husbands must be far more uxorious and credulous than might be expected of the residents of a northern clime. If a patent medicine man had the making of proverbs he would probably modify the Scotch saying into "There is but one

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\* This article commences the second series upon patent medicines. The object in view is to give a complete account, with analyses, of the principal patent or quack medicines, and especially to bring about such a change in the Law of Patent Medicines that it shall become imperative upon their manufacturers to affix to every bottle or box in which these preparations are contained, a descriptive label fully setting forth the ingredients composing them. This regulation works admirably in various Continental countries. A systematic *exposé* of quack medicines has never before been attempted, and therefore while thanking many friends who have given us encouragement in our task, we feel that we may reasonably ask for a continuance of their co-operation and support, and for any information bearing upon the subject. The first series of articles upon patent medicines has been published in a separate book form, 128 pages, price 1s., by Beaumont and Co., 39, Southampton Street, Strand, London. It includes descriptions and analyses of Mattei's Electro-Homœopathic Remedies, Clarke's Blood Mixture, Holloway's Pills and Ointment, Sequah's Oil and Prairie Flower Mixture, Seigel's Syrup, Dr. Barry's Revalenta Arabica, Chlorodyne and other opiates, Allen's Hair Restorer, Mexican Hair Restorer, Rowland's Kalydor, Singleton's Golden Ointment, Gowland's Skin Lotion, &c., together with a variety of interesting matter concerning quacks and quackery.



remedy, and the great Panjandrum is the sole possessor of it." It could not, however, be said that he treasured it up, but that his chief aim was to part with it, even (as he would have his customers believe) at a most alarming sacrifice.

Take, as an example, the pills so widely advertised, and as equally loudly puffed by their manufacturer, Thomas Beecham. "Worth a guinea a box," he declares them to be, with such perserving pertinacity that one is almost compelled to imagine that Thomas Beecham is the very antithesis of his scriptural namesake, or that he had made the assertion so often that he has finally come to believe in it himself. Yet, he is ready to sell any number of boxes for the ridiculously small sum of one shilling and three halfpence, which trade-discounts would further reduce to ninepence or less. We need not be too particular on this point; but will assume, for the sake of a simple calculation, that Beecham receives for every box that leaves his establishment the grand total of nine bronze pennies.

Just now we quoted a proverb, and the remarks made in the previous paragraph remind us of another, which lays down the commercial axiom that "a nimble ninepence is better than a slow shilling;" implying that it is better to do a quick turnover at small profits than a slow one showing a larger profit on each transaction. Yet, who ever heard of such a straining of this proverb as "a nimble ninepence is better than a slow guinea?" But Mr. Beecham does not get even ninepence per box, for three halfpence vanish in connection with the medicine stamp that adorns each box, and, as will be shown shortly, is the most costly part of the business.

Was such reckless trading ever known before? The only instance which can at all compare with it is that of the old apple-woman who was in the habit of telling her youthful customers that though she bought her stock of apples at the rate of three for a penny, she was in a position to retail them at the rate of four a penny, owing to the

large scale upon which she conducted her purchases.

Perhaps the old dame repeated this assertion so frequently, with such "damnable iteration," as the poet said, that at last she came to believe it, just as Beecham believes—as we have given him possible credit for believing—that the pills manufactured at his place are worth twenty-one shillings a box.

Working out the foregoing figures, according to our unsophisticated mind, Beecham ought to be a millionaire to be able to stand against his continuous heavy losses, instead of being a millionaire, as we are told, through the sale of his pills.

|                                               | £ | s. | d. |
|-----------------------------------------------|---|----|----|
| Value of box of pills (according to Beecham)  | 1 | 1  | 0  |
| Amount received, say ... ..                   | 0 | 0  | 9  |
| Actual loss per box (according to Cocker) ... | 1 | 0  | 3  |

The present period, Christmas, is prolific in crops of conundrums, but we will give a guinea (box of Beecham's pills) to anyone who can produce a greater puzzle, a more complete paradox than this. The Gordian knot is too tightly drawn for us to attempt to undo it. We must, therefore, try to solve the mystery by calling in the aid of a skilled analyst, who will be able to tell us what these golden pellets—these "pearls of great value," "more precious than gold or silver," as Beecham modestly styles them in the printed circular accompanying each box—are composed of.

Goodness gracious! gracious goodness! as our ancient applemoan ejaculated, one dark November night, when a mischievous urchin discharged a specially spiteful cracker under her humble stall. We have, it seems, been discussing the "worth a guinea a box" question upon wrong data; and, seeing that Beecham's assertion about the value of his pills is completely upset by Mr. Stokes' analysis, we are bound to admit one fact—whatever else may be disproved—namely, that Beecham is not such a loser after all.

## MR. STOKES' REPORT.

Analytical Laboratory,  
December 21st, 1891.

Dear Sir,—On December 15th, I received from you a box of "Beecham's Patent Pills." The box was securely fastened with the unbroken label of the Inland Revenue Office.

I have now made a careful chemical and microscopical examination of the pills.

The mass of the pill material consists of ground ginger.

The active ingredient of the pills is aloes.

In my opinion the pills consist solely of aloes and ginger mixed up with soap.—Yours faithfully,

ALF. W. STOKES, F.C.S., F.I.C.,  
(Public Analyst.)

To the Editor of HYGIENE.

Further investigations demonstrate that the proximate proportions of the three ingredients named in Mr. Stokes' report are as follows:—Soap, 1 part; ginger, 2 parts; aloes, 2 parts. What a revelation to be made on St. Thomas's Day—not Thomas Beecham's. Well, if Beecham's scriptural namesake had had to do with Beecham's pills, considerable latitude for scepticism should have been allowed to him.

Soap, ginger, aloes; according to Beecham's assertive advertisements, some thirty or so of little pills, composed of three materials, of about the cheapest possible character, are worth a guinea a box! In other words, averaging 36 pills in a box,—we are not particular as to one or two more or less, so long as we are not expected to swallow either them or the assertion,—each pill may be calculated, on Beecham's estimate, at 7d. Writing as we are at a season of the year when everyone is in a charitable mood, we do not desire to be too critical, but we cannot help wondering where Beecham buys his soap, his ginger, and his aloes, to bring his pills up to this average value. Tons of soap, tons of ginger, and tons of aloes, made into tons of pills (otherwise, "pearls of great value") ought to bring in something "more precious than gold or silver" of allegory, namely, "brass," as our Lancashire friends would say; for, as we reckon the results of such manufacture, if it were not for the patent medicine stamp, Beecham's pills would not cost

even one penny to make a boxful. But the Inland Revenue stamp comes in useful, as it enables Beecham to call his nostrum, "Patent Pills," and thus convey to customers the mysterious idea that they have some remarkable special properties.

And so they ought to have, if there is sufficient foundation for the high praises bestowed upon them by Beecham, in his circular, wrapped around every box of pills. They are suited to "females of all ages," says Beecham. This is a good sweep of the net, when it is considered that the feminine outnumbers the masculine portion of the community; but Beecham scorns to do things by halves, and consequently we were not surprised at finding the pills recommended, at page 5 of his circular, for "a class of disorders that afflict *all ages and both sexes*, from youth to old age." Here is a still wider sweep of the net, seeing that it takes in every human creature! Whatever else might be said of Beecham, he cannot be accused of leaving too many chances for other patent medicine vendors.

After the statement just quoted, others seem, by comparison, mild. Still, we may refer to some. The pills "may be given to an infant, or to the aged and infirm, with perfect safety"; they "give tone and energy to the muscles, and invigorate the whole nervous system"; they "produce sound and refreshing sleep"; they are "gude for sair e'en," as a Scotchman would say, or, as Beecham puts it, "the eyesight is strengthened beyond conception"; they destroy "the seeds or *symptoms*\*" (this is Beecham's spelling, not ours) "of direful diseases." N.B.—In these last-named affections large doses are recommended, and Beecham shows a decided tendency towards liberality in this respect; he "giveth with a free hand," as becomes a philanthropist who is perpetually distributing guineas in return for pence. If Beecham sold his pills at the value

\**Hitching* of the breast or head is a "symptom" which Beecham mentions elsewhere.



he puts on them, a guinea a box, taking his pills would be like swallowing money. For persons "labouring under the influence of drink" he advises six or eight pills as a dose. Rough on those who overstep the bounds of moderation at this festive season, some of our readers may think; but then, if, as Shakespeare wrote, men "put an enemy in their mouths to steal away their brains," they must bear the consequences, and they are entitled to scant sympathy even should they take the entire contents of the box.

The quotations we have given are sufficient specimens of Beecham's modesty. Indeed, he is sometimes so carried away by his feelings that he appears to fancy himself, or to wish to convey to his customers that he is, a qualified doctor. We have heard people speak of Doctor Beecham's pills. A search through the Medical Register failed to discover the name; and a query addressed to the Secretary of the Pharmaceutical Society elicited the answer that the name of Thomas Beecham does not appear either in the register of the members of that Society, or in that of the Chemists and Druggists of Great Britain. The error may have arisen from Beecham's own utterances, like the following:—

"It falls to the lot of very few practitioners to go through the experience that I have had in this class of diseases," he writes in his circular, with reference to certain affections, which, to say the least of it, it is not decent to discuss in a circular widely distributed amongst males and females, young and old; "though," he continues, "for many years I have not treated on this subject here, neither was it my intention to do so, but as everyone has a duty to perform, I feel that I shall not be doing my duty if I any longer withhold that advice and information which thousands of the human family stand in need of." Briefly, the advice, given by a man whose qualifications to give professional advice may be summed up in the short word *nil*, is to persevere in taking his triple concoction of

soap, ginger, and aloes—six pills daily—while the information this great (!) medical authority vouchsafes is, that "BEECHAM'S PILLS will be found to be a pearl of great value," and that "they will, as sure as water quenches thirst, search out," and, of course, cure one of the most terrible diseases to which human flesh is subject. Remarkable information, truly; but, in his anxiety to get people to swallow half a dozen pills daily, he has omitted to tell us which of the three ingredients in the pills is the wonderful specific for venereal affections. Is it the soap, or the ginger, or the common aloes? The last-named is the active ingredient of Beecham's pills, just as it is of Sequah's Prairie Flower Mixture, of Holloway's pills, and of Mother Seigel's syrup. The ancients described four elements, namely, air, earth, water, and fire. If patent medicines had existed in those days, aloes would probably have been included as a fifth, so universally is it to be found in quack remedies.

THE EDITOR.

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### COTTAGE HOMES FOR THE INDUSTRIAL CLASSES, IN THE NEIGHBOURHOOD OF LARGE CITIES.

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By ROWLAND PLUMBE, F.R.I.B.A., D.S., F.S.I.,  
Architect to the Artizans, Labourers, and  
General Dwellings Co., Limited.

IN common with many experts who have given great attention to the subject, I hold strongly the opinion that every effort should be made to prevent any further concentration of industrial homes in the already overcrowded streets of the central districts of the metropolis. These residences should be scattered widely, and should be situated as far as practicable from the already congested central districts, and the working classes should be induced to spend their hours of rest and recreation in the purer and more abundant light and air of the suburbs. Especially is this desirable in the case of the wives and children, even though

quarters may be found in the best built and most advantageously situated flats in the many blocks of model dwellings that have been provided so largely of late. This opinion is strongly confirmed by the view taken in an article contained in the recently published volumes of Mr. Charles Booth's valuable work on the "Labour and Life of the People." It is written by Miss Octavia Hill under the heading "Blocks of Model Dwellings," Vol. 2, Sec. 2, Page 262, "Influence on Character." The article is much too long to quote on the present occasion, but is strongly in favour of separate cottage homes, while the many objections to block dwellings are forcibly demonstrated.

In building new districts, social and class prejudices have hitherto prevented the richer and more cultured classes of the population from living in close proximity to those whom they consider below them in social standing. This prejudice is probably as strong also on the part of the poorer population, and so each class prefers to keep to itself. These tendencies are unfortunate, and in the present state of society, seemingly insurmountable. The great difference in the value of land and property in fashionable and poorer neighbourhoods also prevents proximity of the classes; still, in providing estates for the industrial population, an attempt should be made to get as great a mixture and variety in the social scale of the inhabitants as is practicable.

Therefore in providing model villages for the artisan and industrial class I think that provision should be made, and attractions should be laid out, for all sorts and conditions of inhabitants likely to reside in them. The site should be a salubrious one, all natural defects of soil and climate should be overcome as far as possible. The locality should be easy of access to large industrial centres, with cheap and frequent means of transit by road and rail. They should be laid out with wide and well made roads and footways, which should be planted with suitable trees, and

made as attractive as possible. The drainage and sanitary arrangements should of course be perfect, each home should be self-contained, and should be bright, cheerful, well arranged, commodious and healthy, the houses well set back from the public footway, with gardens in front and a good drying ground in the rear, which could also be laid out as an additional garden or recreation ground, and where under proper regulations, domestic animals and poultry might be kept.

The houses should be varied in plan and accommodation to suit the habits of all the classes, and of the different sized families likely to occupy them. They should, of course, be substantially built, and every sanitary requirement should be provided. They should be decorated and finished in a pleasing manner to suit the best taste of the occupants, and a general air of comfort, brightness, cleanliness, and cheerfulness should be given to them, as also to the estate generally. Open spaces for recreation and for garden allotments should be provided. Pressure should be brought to bear upon the local authorities so that the provisions of the Education Act, the Baths and Wash Houses Act, the Public Libraries Act, and all other beneficial legislation of a like character should be carried out, and suitable buildings for the same should be provided. Churches, parish rooms, public board schools, Polytechnic institutes, coffee taverns and clubs of all kinds should also be provided, a sufficient provision of shops should likewise be built in suitable positions, and the question of public house accommodation should also be most carefully considered, and (if provided), not placed in positions likely to create discomfort and disorder.

The classes of people inhabiting such estates should pay weekly rents, and habits of thrift should be encouraged by always insisting that the rents should be paid, at least, one week in advance. The inhabitants should also be encouraged to invest even small amounts in the



capital of the Company, so that they might co-operate in its undertakings. Houses should not be sold to individuals, as in that case abuses at once spring up, but the whole estate should be owned and managed by one Company, the tenants being shareholders wherever possible. The inhabitants should be encouraged to take an interest in the maintenance of the Company's property, and forms should be provided on which should be stated any want of repair or other matter requiring attention; these should be left at the estate office, and a staff should be appointed to attend to the same. The Company should maintain and manage a proper staff of officials and workmen to attend to all matters of repair and maintenance. It should be established on a proper business footing, and financially it should be so managed as to pay a remunerative rate of interest to its investors. However philanthropic the motives of the promoters may be, there should be no sense of favour to the inhabitants who should be encouraged to feel that they are paying a fair rental for the accommodation provided. The Company should aim at paying a dividend, on each estate, of 5 per cent., but it is highly probable that as the property extends and the security increases in value, the public would be found willing to invest in it at a considerably lower rate.

Now the foregoing sketchy description of a model cottage village may seem to many of my readers overdrawn, if not altogether chimerical. In order to prove that it is not so, I propose to give a short account of the latest village of the kind, which has been actually erected under my design and superintendence.

This estate, having an area of 100 acres, is called Noel Park and is situate at Wood Green, a suburb in the N.E. district about ten minutes' walk from the Hornsey and Wood Green stations of the Great Northern Railway. Green Lanes and Noel Park station of the Great Eastern Railway is actually on the estate, and steam tramways run along the main road

on which it is situate. It has a very gentle slope towards Tottenham; the soil is the usual dense clay found in the outlying parts of London on the north side of the river, and always much improved by roadmaking, planting, paving, and draining.

The main avenue is 60 feet wide, other avenues are 50 feet wide, and the cross streets 40 feet wide. As the houses are built, the roads are completely made up, channelled and curbed, and the footways are entirely paved with York stone, and planted at regular intervals (mostly with plane trees). At present it is contemplated to provide a large open space as a recreation ground.

The general drainage of the estate, in accordance with the requirements of the local authorities, has been arranged on the dual system, the rain and surface water being kept separate from the sewage. No drains run through the houses, back drains with intercepting manholes, specially ventilated, being provided to all terraces. The system of ventilation of sewers has specially been considered, the usual ventilating openings in the roads are arranged to act simply as inlet ventilators, the sewers having manholes at short distances apart, with specially designed valves and upcast ventilation shafts carried above the houses. Automatic flushing tanks are also provided.

In laying out the estate, care has been taken that all houses are set well back from the road, all having front gardens, and the objectionable practice of bringing the corner houses out to the pavement line of the return roads is in all cases avoided, the corner houses of the terraces being set back, and specially designed and planned, so as to form an architectural adornment to the terrace of which it forms a part.

There will be about 2,500 houses and shops built on this estate mostly of five different classes. About 1,300 houses are already built, and are nearly all occupied.

The first class houses are built on plots having a frontage of about 16 feet wide, and 85 feet deep,

with a floor area of about 1,065 feet on both floors, containing eight rooms, including the scullery. Each house is provided with two sitting-rooms, kitchen, washhouse, and four bedrooms, also a back entrance, with coal-cellar, larder, washing-copper, and water-closet, and in most cases an additional water-closet on the chamber floor. The houses are let at a rental of from 11s. to 11s. 6d. per week, including all rates and taxes which are paid by the Company.

The greater number of these houses are provided with w.c. on the first floor, and in such cases the back rooms are fitted up as kitchens and sculleries complete, so that they may accommodate two families if required.

The second class houses are built on plots having a frontage of about 15 feet 6 inches by a depth 80 feet. The floor area is 936 feet, containing seven rooms, there being only three bed-rooms on the first floor. The other accommodation is similar to that last described, except that there is no upstairs water-closet. The weekly rental of these houses is about 10s. per week.

The third class houses are built on plots having a frontage of 15 feet by a depth of about 70 feet, and contain a floor area of about 800 feet, containing six rooms, three being bedrooms. The weekly rental of these houses is about 9s. per week.

The fourth class houses are built on plots having frontages of about 14 feet 6 inches by a depth of about 70 feet, with a floor area of 660 feet, containing five rooms, there being two bed-rooms on the first floor. The rental of these houses is about 7s. 6d. per week.

The fifth class houses are built on plots having a frontage of 13 feet by a depth of 60 feet. The floor area is about 470 feet, containing a front living-room, with kitchen and small wash-house behind, with two bed-rooms over. The rental of these houses is about 6s. per week.

In addition to the various classes of houses described, an endeavour has been made to pro-

vide for still further varied requirements by adapting them as flats, two storeys high, for two families. In the case of third class houses, the stair-case is shut off, the upper floor being arranged as a separate dwelling, consisting of a living room and two bedrooms, with an outside stair-case down to the back-garden, the closet and wash-house being held in common. These are let at 4s. 6d. per week the lower flat, and 5s. per week the upper flat. Advantage is taken in the case of the corner-houses to get separate entrances at the side.

In the second class houses, so arranged, each flat has its own scullery, wash-house, and w.c. The rental of these houses is 5s. a week for each floor and 6s. to 7s. a week for houses with special accommodation.

In the case of the first class houses so arranged (being the last development of two-flat cottages built on the estate), the frontages are extended from 16 feet to 19 feet, and entirely separate entrances and outside doors are given to each flat, a small additional bed-room being obtained on the first floor. The rental of these houses is 7s. a week ground floor and 8s. a week for first floor flats. The corner houses have an extra floor, and are let at special rates, viz: 10s. 6d. for the first and second floors.

It is proposed that by far the largest number of houses built should be of the smaller class, in order to encourage the industrial classes in the effort to avail themselves of houses at a rental which will not make it necessary to take in lodgers.

In the general planning of these houses the Company does not profess to show any specially new arrangement, the type, with the exception of the fifth-class houses and double flats, being that which seems to have been universally adopted in all town and suburban terrace dwellings, as giving the greatest accommodation at the cheapest rate; where, however, any special requirement has to be met, as, for instance, in the case of shallow, corner, and other irregularly-shaped plots, the architect has availed himself of the opportunity to design plans of almost every variety of arrangement.

*(To be continued.)*



## Reviews and Notices of Books.

*Nursery Hygiene*: By B. B. JOLL, M.B. Lond.  
Pp. 109. London: H. Kimpton.

*Nursery Handbook*: By J. J. MARSH, L.R.C.P.  
Pp. 48. London: Churchill.

THE hygienic management of infancy and early childhood is a subject of far greater importance than is commonly recognised. "Just as the twig is bent, the tree's inclined," is an axiom which holds good, as regards both the physical and mental future of the child.

But, for some mysterious reason—possibly to be found in the unwritten etiquette of the profession which treats as "taboo" any works by professional pens intended for non-professional readers—this branch of hygiene has been neglected, or a series of platitudes strung carelessly together have been assumed to be sufficient for the purpose.

Dr. Joll's book is one which has not been framed on such lines; the subject has been well thought out and arranged, and the book is well written, so that every chapter is full of information valuable to those who have the charge of children. Chapter 1 defines the nature and scope of hygiene, and forcibly points out the dangers arising from neglect or ignorance of proper sanitation. The next chapter deals with the nursery, its ventilation, warming, lighting, and furnishing. Chapter 3 is devoted to an indispensable appendage to every nursery, and that is the nurse herself, whose qualifications and duties are thoroughly set forth, as well as those of the attendants engaged for the lying-in room, or for bringing up the infant, in the event of the mother being unable. The diet, exercise, and clothing of young children, from the earliest stages of infancy, occupy three more chapters. Chapter 7 is upon the preventible diseases of children—tubercle, rickets, &c., while the subsequent one treats of infectious diseases—small-pox, scarlet fever, measles,

whooping-cough, diphtheria, and typhoid fever, giving rules for the prevention of their spreading, and an account of the principal disinfectants and their uses.

Dentition is so often regarded as a morbid condition, or, if not of itself a disease, at least a direct cause of it, that Dr. Joll very properly points out the fallacy of such a view. It is, as he says, a purely physiological process, which often gets the blame of diseases or derangements of various organs, merely because it happens at the same time with their appearance to give rise to some amount of constitutional disturbance. At the most, dentition is rather to be looked upon as a predisposing cause of disease than as a diseased condition.

Dentition and the minor ailments of childhood have a chapter to themselves, and we are glad to see that Dr. Joll severely comments upon the too frequent practice of drugging children with different quack medicines.

Some excellent remarks on education, recreation, exercise, stimulants, and sleep will be found in the concluding chapter.

Dr. Marsh's book is smaller than that which we have just noticed, but it contains a considerable amount of useful information for mothers and nurses; such as the preparation for confinement, the treatment of the mother subsequently, the care of the infant at and after birth, infant feeding, weaning and artificial food, nursery hygiene, dressing children, nursing sick children, and vaccination.

*Webster's International Dictionary*. Pp. 2,118,  
with 3,500 illustrations. London: G. Bell  
and Sons.

It is impossible to give more than a faint idea of the character and value of this compendious volume, which, containing more than two thousand pages, is a most useful book of reference for every library, public or private. The publishers are to be specially commended for bringing out so valuable a book at so low a price.

## Notes and News.

DUBLIN stands greatly in need of thorough sanitary renovation. With a population of only a quarter of a million the average number of cases of enteric fever is one-fourth that of London, which possesses a population of about 5,000,000, or, roughly speaking, twenty times the number of inhabitants in the Irish metropolis. A main drainage scheme is proposed, at a cost of £250,000.

THE METROPOLITAN WATER SUPPLY.—Professor Frankland reports that the result of analyses of samples of water taken from the Thames by the various water companies, during the recent floods, was that they were found to be seriously affected. The water was brownish in colour, and the organic matter in solution was highly in excess of what it ought to be. Professor Frankland says that, with the limited storage which these companies have, it is impossible for them to avoid the delivery of polluted flood water. The supply of proper and sufficient water to the metropolis is fast becoming a question of the greatest importance. In October last, 10,494 more houses were supplied than at the corresponding period of the previous year, while the daily supply was increased by nearly two and a-half million gallons.

STARVED SCOTLAND; CONGESTED IRELAND!—The *London Gazette* some weeks back contained the names of a Commission, composed of Lord Lothian and others, appointed for carrying out a scheme for the colonisation in Canada of crofters and cottars from the Western Highlands and islands of Scotland, and of inhabitants of the congested districts of Ireland. The commissioners are authorised—1. To proceed in the selection of families from the said districts, and their settlement in the Dominion of Canada. 2. To provide from the funds at the disposal of the Commissioners, furnished by Parliamentary grant, such advances to the settlers as may be necessary, and to undertake the collection of instalments of capital and interest in repayment of such advances. 3. To take and hold mortgages on the lands, and liens on the chattels of the said settlers, and to proceed in the recovery of debts. What a miserable parody of national justice to poor people who merely ask for sufficient land to enable them to earn a decent subsistence in the localities where they were born and bred! A species of disguised transportation! The great landowners cannot clear them off the ground fast enough in order that deer forests and shooting preserves may be substituted for the homesteads and little farms of an industrious, peaceful population. Congested Ireland, forsooth! In 1845, the population of Ireland was estimated at 8,295,061. At the present day it is considerably below five millions—less, indeed, than it was at the commencement of this century. The remedy for the starvation of the crofters in Scotland, and for the similar condition of the inhabitants of the so-called congested districts of Ireland, is not compulsory emigration, at the expense of British ratepayers, for the benefit of a few wealthy, selfish landlords; but a more easy tenure of land, permanence of holding, and the development and encouragement of local industries. According to the statistics furnished some years ago, on the authority of Mr. John Bright, one-fifth of the land in England and Wales was then in the hands of 523 landlords; while more than one-half of English and Welsh soil was owned by 4,500 persons. One-fourth of Scotland was in the hands of 24 individuals.

NEARLY THREE HUNDRED THOUSAND ACCIDENT CASES are treated yearly in the metropolitan and suburban hospitals. Last year at Guy's no less than 20,766 such cases were treated. Many of the cases going to make up the large total were of a severe nature, such as fractured limbs, broken ribs, and injuries from falls or vehicles.

THE CROPS FOR 1891, in England, fell much below the average in consequence of the wet, unfavourable season. The total yield of wheat was a million bushels less than in 1890; barley was nearly two millions of bushels less than in that year, although the amount under cultivation was more considerable; while oats realised nearly eight million bushels less. The average produce per acre was as follows:—Wheat, 31½ bushels; barley, 34 bushels instead of 35; oats, 39 bushels, as against 41½ bushels per acre in 1890.

LOCAL OPTION AT A WORKHOUSE.—The inmates of the Islington workhouse, to the number of 500, were recently canvassed as to their views on the usual Christmas allowance of beer on the 25th of December. Upon being asked "How many would be willing to have ginger beer instead of ale or porter?" only seventeen hands were held up for the first-named beverage. Next, "How many would like tea or coffee?" was asked, but not a single affirmative answer was obtained. In favour of milk as a substitute for beer eleven hands were held up. Finally, the offer of twopence in money, in lieu of the beer allowance, had not a single supporter; the result, therefore, being that out of 500 over 470 voted for beer.

STRYCHNINE AS AN ANTIDOTE TO SNAKE POISON has been used in upwards of one hundred cases by Dr. Mueller, of Yackandandah, in the colony of Victoria, with only a single failure, which, by the way, Dr. Mueller ascribes to not pushing the remedy sufficiently far. In some of these cases it should be mentioned that the patients were at the point of death when treated. Dr. Mueller's plan is to inject a solution of nitrate of strychnine in water, of the strength of one part of the former to 240 parts of the latter, with a little glycerine added. Although the injection may be made under the skin at any part of the body, the neighbourhood of the bitten part is preferable. Dr. Mueller says that the two poisons—strychnine and the secretion from the snake's fang—are "thoroughly antagonistic"; whence the tolerance by the patient of a quantity of strychnine, which, without the presence of the snake poison, would prove fatal.

GAMBLING ON LIVES.—The practice of insuring against the deaths of others, sometimes even not related to the persons holding the policies, prevails to a great extent in some of the large towns in the North of England. At Blackburn, recently, a claim against the Royal Liver Friendly Society was heard before the magistrates, who commented severely upon so reprehensible a custom. "Here," said the chairman, "we have had a woman holding eight policies on lives in which she had not the least insurable interest, an agent allowed to effect these policies knowing that they were illegal and a company taking these policies." Eventually, the magistrates refused to make an order for the sum claimed, and expressed the opinion that "the whole system is so bad that it needs to be publicly condemned." Thus the punishment fell on the policy-holder; but it ought also, in some way, to have been made to reach the agents who persuade poor and ignorant people to effect insurances of this kind. They are bad enough when adults are the subjects of insurance; when children, especially of tender age, are insured, the temptation to serious crimes is obviously increased.



**A ROLAND FOR HIS OLIVER.**—"I feel tired and worn out, and I'm on the way home, Doctor; what ought I to take?" said a citizen to a medical acquaintance, from whom he was trying to get some gratuitous professional advice. "Take a cab," replied the physician, to the great disappointment of his querist.

**ALE HOUSES** were pretty plentiful in the olden times, judging by a list, still extant, of such places of public refreshment in London, in the year 1552. Westminster headed the list with 42; St. Martin's Parish, "nigh Charing Cross," had 16; High Holborn came next with 14; Stratford-at-Bow, St. Clement's, (Strand), and Isseldon (now Islington) had 13 each; Whitechapel and St. John Street, 12 each; Chancery Lane, St. Giles, and Smithfield, 11 each; Clerkenwell, 10, and so on; making a total of 312 licensed houses, a high average, when it is considered that the population of London in those days was less than that of many of our large provincial towns at the present time.

**INSANITARY DWELLINGS IN ESSEX.**—Dr. Trevor Fowler has drawn up a report with reference to cottage property at Loughton, a village in the Epping Rural Sanitary district. Dr. Fowler visited upwards of a dozen cottages, all of which were more or less dilapidated, deficient in sanitary requisites, dangerous to health, and utterly unfit for human habitation. In some cases, overcrowding existed to a considerable extent. The authorities have served notices upon the owners, requiring them to put their property into a habitable condition. We hope that other rural sanitary authorities will follow the example set by those at Epping, and instruct their medical officers to report upon the condition of cottages in their respective districts.

**LONDON WATER SUPPLY.**—Two Bills relating to this important question have been deposited in the Private Bill Office of the House of Commons, one by the City Remembrancer on behalf of the Corporation of London, and the other by the agents of the London County Council, making provision for the appointment of a Joint Water Committee, on the lines of that which met with the approval of Sir Matthew White Ridley's Committee, last session. It is proposed that the committee shall consist of 48 members, 40 of their number to be appointed by the London County Council and the remaining 8 by the Corporation. It will be seen that no provision is made for the representation of the outside areas, as the Bills are limited to the area of the supply of the eight London water companies; but, seeing that the majority of these companies supply towns and districts lying at a distance from London, it is probable that various County Councils, such as those for Surrey, Middlesex, Essex, and Hertfordshire, will claim some representation upon the Joint Committee. The powers of the Water Committee are to be as follows:—

1. To make any public or private inquiry as to the existing supply of water within the Metropolitan area, the charges for the same, and as to the possible sources of supply, and to enter into negotiations with any public authority, water company, or persons for the acquisition of their powers or undertakings, or any part thereof.

2. To make and enforce regulations from time to time for defining the strength, nature, and materials of fittings to be used for the purpose of preventing the waste or nuisance of water.

Full powers are given in the Bills, enabling the Joint Water Committee to carry out the various provisions contained therein, subject to the ratification of the London County Council.

**A WELL - DESERVED APPOINTMENT.**—Miss Lankester, who has for a number of years ably filled the secretaryship of the National Health Society, has been appointed secretary to the Ladies' Committee in connection with the Chicago Exhibition, of which Princess Christian is the president.

**ARTESIAN WATER SUPPLY IN THE CITY.**—Dr. Sedgwick Saunders, Medical Officer of Health for the City of London, reports the quality of the water drawn from the artesian well which is being sunk at Aldgate, as high up in the list of first-class potable waters, and moreover of remarkable softness, and therefore admirably adapted to domestic and manufacturing purposes, as well as for use in boilers. The men engaged in boring found the chalk at a depth of 252 feet; but although they have gone 218 feet below that depth (making a total of 470 feet), they have not yet passed through the chalk. It is proposed to carry the borings down 100 feet further.

**INFLUENZA.**—In a lecture recently delivered at Vienna, Professor Nothnagel said that it had been ascertained that influenza appears during three or four consecutive years, and is then almost entirely forgotten for twenty years only to return again with fresh vehemence. He is convinced that the disease is infectious, though the cause of the infection has not been ascertained. The Vienna faculty has found that there are three kinds of influenza—nervous, gastric, and catarrhal. Deaths from influenza have generally resulted where the organs of respiration are attacked. There is a pneumonia which results absolutely from influenza. This is much more dangerous than bronchial pneumonia, because it always affects the heart most seriously. It should be said that all with weak hearts, or who suffer with the lungs, run greater danger from influenza than others. Professor Nothnagel urgently warns the public against the use of the favourite drug antipyrin or antifebrin. It must be ascertained whether there is pneumonia resulting from the influenza, in which case the muscles of the heart are attacked. In this case stimulants must be given, and subcutaneous injections of camphor. In special cases baths have to be taken.

## SPECIAL NOTICES.

**EDITORIAL.**—The Editor will be pleased, at any time, to receive communications, books for review, etc., bearing upon the numerous important subjects dealt with in these columns.

**PUBLISHER'S NOTICE.**—The Annual Subscription is reduced to 6s., for which *HYGIENE* will be forwarded, post free, for 1892, to any address in Great Britain and Ireland, Australia, New Zealand, Canada, the United States, Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Russia, Portugal, Spain, Sweden, Switzerland, Turkey, and other countries included in the Postal Union.

**HYGIENE FOR 1891.**—The title-page and index of the volume closing with the present number are published with the present issue.

# HYGIENE,

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## ARCHITECTURE IN RELATION TO HYGIENE.\*

By Sir ARTHUR W. BLOMFIELD, M.A., A.R.A.,  
F.R.I.B.A.

ONE of the greatest of our English authorities on the subject—the late Mr. Fergusson—in the introduction to his well-known handbook, defines architecture to be “the art of ornamental and ornamented construction,” and, further on, speaking of the architect, he says, “It would be well if, in most instances, he could delegate the mechanical part of his task to the engineer, and so restrict himself entirely to the artistic arrangement and ornamentation of his design.”

If this view of architecture, and the legitimate duties of the architect, were generally accepted as correct, the relation of architecture to hygiene would be reduced at once to something not always easy to trace or grasp, and which has never yet received the full amount of serious and careful attention which it well deserves. In that case most, if not all, of the valuable and interesting papers which we are about to hear and discuss would have to be addressed to some other more purely scientific section.

If, on the other hand, we take the more usual

definition of architecture as “the art and science of building,” its relations to the science of hygiene at once become too varied and too complex to admit of clear and concise description. A vast field is at once opened out before us, in which it is often extremely hard, sometimes even impossible, to indicate with precision the line of demarcation between the domain of the architect and that of experts in several other branches of science. As one out of many illustrations which might be cited of this difficulty, I may mention the wide and interesting subject of paving, which pays so important a part in the health, comfort, and well-being of communities.

This large question seems to occupy a kind of neutral ground between the province of the architect and that of the civil engineer.

Directly scientific considerations are admitted side by side with the purely æsthetic aspect of architecture, it becomes hard to name a subject for discussion at a Congress of Hygiene which would not be as suitable for an engineering, medical, or other scientific section as it is for that of architecture.

For this reason I venture to throw out the suggestion that for some future meeting of this Congress an extremely interesting and instructive paper might be written dealing exclusively with the points of contact between hygiene and the purely æsthetic side of architecture.

This branch of a great subject remains up to

\*The Presidential Address delivered in the Architectural Section of the Congress of Hygiene.



the present time practically almost untouched, perhaps, partly from the fact that to many minds the attempt to establish any such relationship appears fanciful and unpractical. It is well known that one of the greatest of our English pioneers of sanitary science, the late Sir Edwin Chadwick, viewed the idea of any such connection with disfavour, and even with anger; he seemed, indeed, to think that art and hygiene were not only unconnected, but even in some respects incompatible.

Notwithstanding this decided opinion of a great and deservedly respected authority, I do not think it would be difficult to show that such a connection has, at any rate, for certain minds and constitutions, a very real existence; neither would it be hard to prove that, although never, perhaps, closely followed up or fully worked out in all its bearings, the idea of some actual relation between beautiful and artistic surroundings and health, must have been present in the minds of many writers, both ancient and modern. Time forbids me to do more than instance a very few examples.

I cannot refrain from giving one of great weight and venerable antiquity, which I find in the third book of Plato's "Republic."

"Let our artists," he says, "be those who are gifted to discern the true nature of beauty and grace; then will our youth dwell in the land of health, amid fair sights and sounds; and beauty, the effluence of fair words, will visit the eye and the ear, like a healthful breeze from a purer region, and insensibly draw the soul, even in childhood, into harmony with the beauty of reason."

Thus, it would appear the great philosopher held that the finest productions of art, acting through the eye on the mind, exercise a distinct influence on bodily health; and if, as Emerson tells us, "Out of Plato come all things that are still written and debated among men of thought," we may take this passage as a type of many similar thoughts scattered through the works of numberless authors from his day down to the

present time. May not the same idea be traced in the much-quoted line of our own poet Keats, "A thing of beauty is a joy for ever?"

At present, no doubt, large masses of people are still so habituated to these last characteristics in their everyday surroundings that they scarcely feel a wish for anything better, just as they will get accustomed to evil smells, and a vitiated atmosphere which they breathe, quite unconscious of the insidious and deadly effects on their health.

But if education and culture continue to advance as they have done in the last fifty years, and habits of intelligent observation are fostered and encouraged, the eyes of the masses will every day become more sensitive and fastidious; the dreary and monotonous streets and badly designed buildings which a few years ago would have been passed unnoticed, will soon begin to exercise a distinctly depressing and disturbing influence on the mind, which cannot fail to have some ill effect on the health, comfort, and general well-being of the community.

It is now, I believe, a recognised fact that certain colours, quite apart from the nature of the pigments or dyes which give them, produce very decided effects, both on the mind and body when in certain conditions.

It is probable that the same is true of certain combinations of colours and even of forms in which the skill and taste of the artist must be paramount, and in which the aid of science, however necessary, can only be looked upon as subsidiary.

Valuable hints and suggestions bearing on this subject may be gathered from a lecture delivered many years ago at the Royal Institution by Cardinal Wiseman, entitled "Points of contact between Science and Art." Also from an address delivered by Mr. Wyke Bayliss, President of the Royal Society of British Artists, "On Sanitary Reform in relation to the Fine Arts," at the Sanitary Congress held at Hastings in 1889.

As might naturally be expected from such a

source, it teems with beautiful and poetical thoughts bearing on the subject. He shows how ruinous are dirt and disorder to the best interests of art, and how all artists must hail every onward step in sanitary reform as not only conducive to bodily health, but to the growth and progress of art. The whole cannot fail to be read with as much pleasure as profit, and anyone who desires to follow out the line of thought I have suggested in tracing a direct connection between architecture as a fine art and hygiene, will do well to study this address with great care and attention. But the illustrations, arguments, and advice made use of are directed more to the influence of sanitary reform on the growth and development of art than to the effect of art on health, a more obscure, perhaps, but no less interesting subject, and the one I desire to see dealt with.

I have left until the last all mention of the only writer who, as far as I know, has ever made any serious attempt to deal systematically and in detail with this interesting subject.

Some years ago my friend Dr. B. W. Richardson, who stands in the foremost ranks of sanitary authorities, delivered a lecture upon it, which, I am afraid, is now out of print, and I have been unable to obtain a copy; but he has kindly furnished me with some information about it.

He tells me that the principal points he dwelt on were as follows:—

He began by showing that much prejudice had been excited against some of the best sanitary inventions and labours, because leading sanitarians have failed to consider artistic construction as part of sanitary construction; their whole minds have been absorbed in the useful, and they have permitted all that is ornamental to pass by as if good taste were disconnected with sanitation. He argued that this was a grand mistake; that ugliness was an offence to good health, and that beauty was an aid to the best health.

He showed that when mind and body are

enfeebled by bad health, the introduction of disagreeable objects into the sick-room or ward is painful and injurious to the occupants; whilst the presence of beautiful flowers, pictures, and designs is curative in its effects: a kind of mental tonic which gives tone also to the body. This thought led him to the consideration of the best forms for hospital wards, having regard to the effect on the eye, and through the eye on mental and bodily health, and so with all the details of visible construction and of decoration.

Speaking of the dwelling-house, he maintained that no part ought to be excluded from the possession of architectural art, because it is the tendency of the human mind to let that which is disagreeable, plain, and ugly, go without regard, and accumulate dirt and disorder. Hence all the offices of a house should have as much care bestowed on them as the living-rooms to render them bright and cheerful, and to make cleanliness as obvious a necessity in one as the other. In this lecture Dr. Richardson made a great point of the treatment of floors, adverting particularly to the ancient Roman mosaic floors, which were not only beautiful works of art, but easily cleaned, and by the well-known hypocaust system of warming diffused an equable and agreeable warmth through the room without draughts.

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## THE RELATION OF ATHLETIC SPORTS TO PUBLIC HEALTH.

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BY HENRY HOOLE, M.D. (LOND)

Author of the "Science and Art of Training."

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### PART I.—THE EVOLUTION OF SKILLED MUSCULAR EXERCISE.

THOSE who have carefully watched young children at play must have noticed the extreme delight they experience in the mere movements of the body and the limbs. In these exaggerated and apparently purposeless actions they are instinctively gratify



ing the appetite "Exercise,"—an appetite or want of the organism, daily recurring, felt at every period of life, but most intensely felt in youth. When its demands are reasonably satisfied the beneficial effects upon the human economy are, even to a superficial observer, at once apparent; the mind becomes tranquil, the heart throbs stronger, breathing is deeper, the appetite keener, and other less important functions of the body are more harmoniously performed.

The lesson of the dependence of health and strength upon muscular action, if not an intuition of primeval man, would soon have become one. In those remote ages, when he shared with animals not more savage than himself the shelter of sunless forests, he, without doubt, quickly discovered the potential energy stored up in his thews and sinews, and, as quickly, acquired the knowledge of rightly applying it.

The able use of man's first weapons, the club, the stone axe, and stone-tipped arrow, preserved his life under most adverse circumstances. Again, exercise so developed his bodily and mental powers, that, naked or but scantily clad, he could endure indifferently the icy breath of winter or the burning rays of summer, and successfully strive with or attack the fiercest and subtlest of brutes.

Stalwart frame and muscular adroitness represented then the highest point of human development. The savage who could best bear exposure, fatigue, hunger, and thirst, whose skill enabled him to obtain food and raiment when others failed, would obviously be selected by his fellows as their chief. Woman, through instinct of self-preservation, would seek his protection; his children would be more likely to reach maturity; and, according to the law of the survival of the fittest, his race would not readily become extinct. Another great inducement to muscle culture was the desire, which unhappily still lingers in civilised man, to wrest from his fellow-savage the most valuable of his possessions.

While man was thus living in the hunter state, one may reasonably conclude that the exercises most favoured and most cultivated were such as served the purpose of offence, defence, and the acquisition of property. Among the earliest of the offensive games may be reckoned wrestling, the use of the club, the spear, the bow, and, as a more deadly mode of hurling stones, the sling. Now, with regard to defence, is it not feasible to infer that on many an occasion our remote ancestor saved his life by the agility with which he leapt over the fallen forest timber, by the speed with which he fled across the treeless plain, and by the skill and vigour with which he dived into and breasted some rain-swollen stream? An infuriated enemy in the rear would have given him a very limited selection of paths, and but a few moments for choosing.

The mental as well as the physical condition of mankind was, however, progressive, and to the hunter state succeeded the pastoral and agricultural. Man learnt the arts of cultivating the soil, of reclaiming wild animals, and of reducing them to domestication. He became an expert horseman, and could ride at full speed without saddle or bridle. Hunting was not followed exclusively for the purpose of procuring food and clothing, or for ridding the neighbourhood of obnoxious or dangerous animals, but as a pastime, and, with dancing, formed the recreations of peace. Warfare, too, had grown into a science, and intricate and complicated methods of attack and retreat were now employed.

There is very early evidence in the world's history both of the esteem paid to martial accomplishments, and also of the systematic physical culture of the young. Sixteen hundred years before the Christian era, it was decreed in ancient Egypt that all male children born the same day as the son of the king should be set apart, and reared in such a way as to strengthen the body, increase the courage, and make of them able warriors for their future

monarch. Even eight hundred years later muscular training greatly concerned nations who might boast some tincture of civilisation. The Spartan scheme of education, for instance, is well known. All feeble or deformed children were killed at birth; at seven years of age the boys were removed by the State from the parents' care, and were educated until manhood. This education consisted mainly of gymnastic exercises, athletic games, hunting, and the discipline calculated to render them effective combatants. The girls, too, were inducted no less carefully into nearly similar sports. Domestic life must have been a mockery, for the men lived alone in barracks, passed their time in drillings, in the chase, or in teaching the children, and visited their homes and their wives only by stealth.

As a proof of the respect paid by the Romans in the early days of the Republic to the warlike art, I may mention the invocation in their litany for the blessing of Mars upon the spearman. Again, the nation was almost one standing army, for up to two hundred years B.C., every citizen between the ages of seventeen and forty-six was liable to military service; each household was bound to furnish one foot-soldier, and every ten households one horseman. The discipline was Spartan-like in severity, and the soldiers were trained to march long distances, to carry with ease heavy weights, to erect quickly impregnable camps, and to fight skillfully and bravely.

Thus, through countless ages, from that period of human existence which is lost in impenetrable gloom until just before the commencement of the first century, one of the chief concerns of man, it may be reasonably concluded, was physical education. Exercise—the instinct planted within his body—had taught him not only to maintain his health but to preserve his life. It had encouraged the free use of his limbs and senses; his movements both upon the land and in the water equalled almost in speed and adroitness the brutes of the earth.

His foot was as sure as an antelope's, his vision partook of the keenness of the eagle's, his hearing and scent approached in acuteness that of the most cunning of animals; while superior to all created beings in intellect, he walked the earth and stemmed the waves, their lord and master.

In the physical and mental attributes of the savage of the present, one may gather what pre-historic man was in the past. Races are known who still live in the hunter state—in North-East America a tribe whose sole weapons of defence are the stone hatchet and stone-tipped arrow. The islanders of Tierra del Fuego go unclad in a climate almost arctic, do not cook their food, and use the sling as an offensive weapon. The Bosjeman of South Africa is noted for his keen sight, his sure and alert movements, his skill as a hunter, and his powers of enduring fatigue and exposure. The Polynesians say they contracted colds from the time they commenced to wear clothes; and a chief admitted that the abduction of women, and what is now termed "landgrabbing," were the main causes with them of quarrels and of war. The nomadic Mongolian tribes, who live a purely pastoral life, possess to the present day a marked ability in taming and domesticating animals; while Stanley, again, in his recent explorations, has made us acquainted with communities in Central Africa who, having advanced in civilization to the agricultural state, sow and reap their grain, and cultivate their fruit and vegetables.

Higher mental qualities, the standard of excellence among civilized people, are as incapable of recognition by the savage of to-day as they were by his ancestor two thousand years ago. The ideal man of both is the warrior of large stature and iron muscle, fearless and fatal in attack, swift and able in retreat.

Tales of ancient feats by flood and field must necessarily be more or less fabulous. Are they not perchance mirrored in the fortitude, the forest-craft, and the running powers of the North American Indian; in the daring horse-



manship of the wandering races of Central Asia; in the diving and swimming exploits of the islanders of the Southern seas; and in the intrepid management by the West African of his slender canoe? May one not, therefore, surmise that primeval man, upset far from land from his frail bark, chased by an infuriated tribal enemy, or hunted by wolves upon the frozen steppes, although no timekeeper or referee, watch and tape in hand, was present, established records in swimming, leaping, running, and riding unsurpassed by the athletes now most renowned in these departments of sport?

Enough has, probably, been said to show how from one of the primary wants of the body muscular dexterity has been evolved. The age of reason was dawning, and each succeeding generation of man saw a further expansion of his intellectual powers, and a corresponding improvement in his surroundings. His aspirations and capacities were higher and wider, so that means other than muscular were employed to satisfy his passionate desires. There was no longer the necessity to hunt from morn till eve to obtain food and raiment; walls and other defences protected him from sudden onslaughts of enemies; the knowledge of agriculture and of pasturage had endowed him with fruitful fields and teeming flocks.

Woman, too, had not to be won at the point of the sword or dazzled by the display of martial address. She could be gained by the sure possession of the material comforts of life, and by the esteem in which the wooer was held by her kindred. This esteem, again, was not entirely based upon physical qualities. Powers of administration, of organisation, of advising rightly and promptly in times of imminent peril, superior knowledge of the healing art, of tillage, and of breeding stock, together with proficiency in the gentler amusements of leisure, as music, poetry, and dancing—these were now coveted and honoured requirements.

Moreover, the display of warlike feats were

of themselves insufficient to satisfy the self-esteem of the ambitious, or to excite in others the sense of awe and wonder. Like the haughty patrician who even deemed hunting a recreation beneath his dignity, the leader reserved his prowess for the battle-field and, in times of peace or of freedom from the irksome duties of camp gratified his love of sport by watching the brawny adroitness of his inferiors or of slaves trained in all the known arts of the gymnasium.

Mankind, however, was but partly civilised, and neighbouring countries were usually inimical and aggressive. Reason therefore counselled both the heads of states and individuals not to entirely neglect those means upon which depended the integrity of the nation, and the preservation of life and property. Another strong motive for the encouragement of outdoor diversions was the fact, now better appreciated, of the importance of exercise in the maintenance of health and strength.

In the history of our country this question of physical education has until a recent date claimed a large share of the attention of those who held the reins of the government. During the Saxon dynasty the young thane was instructed in casting of darts, hunting, wrestling, running, leaping, and other acts of bodily address. Literature was despised. At twelve years of age the renowned Alfred could not read, but the chronicler states with pride that he was already "a most expert and active hunter, and excelled in all the branches of that most noble art." Some of the more ancient methods of attack were still extant, as slingers and casters of stones formed a regular portion of the Saxon army.

The Norman invasion and the subjection of the Anglo-Saxons to a more refined race profoundly affected the military exercises and recreations of the nation. From this epoch arose a more marked separation of manly pursuits into those necessary for the sterner affairs of war and those for the guilement of peace.

Into both these divisions, again, a class distinction was imported which lingers to the present day. The nobles, for instance, practised the use of lance, mace, battleaxe, shield, and sword, and as it was deemed a high disgrace to be unseated, acquired the thorough command of the horse. For recreations they selected such as would develop the body and inure it to the hardier feats of the fray; wrestled, swam, ran foot races, tilted at the ring, and followed the chase. Besides being skilled in the above, the courtly Norman was expected to be an able carver, a graceful dancer, a proficient musician, and to possess the moral qualities of truth and courage. Those below the rank of a knight were not permitted either to joust or to take part in the tournament. The arts of defence for them were the use of the sword, the pike, the dagger, and the bow; their chief diversions to wrestle, run, leap, tilt with poles at each other or at the quintain, fight with clubs and bucklers, ply the quarterstaff, and throw spears at a mark.

The most popular art of the bulk of the people was without doubt that of the long bow; and, as under the Plantagenets it had become in the hands of the English soldier a most deadly weapon, each successive government was jealous to maintain its efficiency. Thus in the thirteenth century, every person whose revenue from his land did not exceed one hundred pence was commanded to keep a bow and arrows. Similar statutes followed. The sheriffs of London were ordered, under the penalty of imprisonment, to see that the citizens spent their leisure time and their holidays in the practice of archery. These ordinances were needed for other reasons besides the neglect of martial pursuits. The nobles and clergy were addicted to gambling with dice, and the vice had spread to the lower orders, who in addition strongly favoured what Edward III. designated as "trivial, useless, and unlawful games." The reprehended and prohibited pastimes were tennis, football, fives, bowling, and others which

approached in character the modern sports of pitching the stone, throwing the hammer, and tossing the caber.

The long wars with France, and, later on, the internal dissensions of the country, removed, however, all fears of widespread effeminacy; and it was not until the latter part of the reign of Henry VII. that the government had again to take stringent measures in order to cope with the physical degeneracy of the people. From time to time unequivocal signs of luxurious habits had shown themselves among all ranks of society. Tournaments and jousts were held but spasmodically, more for the purpose of displaying magnificent attire and splendid steeds than of exhibiting ability and courage. Indeed, by the middle of the sixteenth century, this far-famed method of fighting was practically obsolete. The influence of Literature, moreover, was making itself felt throughout the whole of Western Europe; and the neglect of letters by the nobility had enabled men like Cardinal Balue in France and Cardinal Wolsey in England to become powers in their respective states. Gunpowder, too, had been invented, and was coming more and more into warlike employment. All these factors materially affected the character of military exercises and outdoor amusements. Among sports, as among species, it was the question of the survival of the fittest; the long bow had supplanted the sling, to yield, in its turn, to the crossbow; this, again, as the musket became perfected, grew less in vogue, and rapidly fell into disuse.

Henry VIII., following in the footsteps of his father, made a strenuous effort to resuscitate the ancient pastimes. By precept and by example he showed himself to be an earnest apostle of physical culture. He created into a corporation, called the "Noble Science of Self-Defence," the professors of the long sword, backsword, rapier and dagger, sword and buckler, pike and halberd, and permitted this corporation to license teachers.



Furthermore, he made it a penalty of £10 to keep the crossbow in a house. It was in vain. Neither royal patronage nor severe laws could galvanise into fresh life these almost moribund mediæval sports. Commerce was rapidly expanding, land around the large towns was increasing in value, and the archery butts were soon enclosed. The energy of the nation was drifting fast into mercantile channels, for our insular position protected us from war, and favoured trade. The courtiers and the citizens grew richer, more addicted to literary pursuits, and at the same time less and less familiar with the implements of war. Wealth brought in its train luxury and licentiousness, and these promoted a distaste for physical exertion.

On the accession of the Stuarts there was indisputable evidence of serious emasculation, and to counteract it James the First encouraged both on Sundays and on holy days "dancing, leaping, archery, vaulting, and other harmless recreations." Public games on the Cotswold hills—the precursor of the sports of the London Athletic Club—were held annually through his patronage, and continued without interruption for forty years. The troubles of the Commonwealth and the strong puritanical feeling of the middle class, who regarded innocent open-air amusements as "unrighteous," effectively stopped further development in this direction. From then to the end of the last century a stagnation in athletic games supervened, the result of prejudice, increased wealth, and the prolonged peace. In the country, it is true, the gentry rode horse-races, hunted the fox and stag, and in a mild way hawked, while the rustics played foot and club-ball, wrestled, pitched the bar, and threw the hammer. The nobles, however, about the court, regarded violent muscular exertion as unfitted to their rank, and took but a languid interest in the contests of professional athletes. With the less exalted citizens pugilism and pedestrian matches were decidedly growing popular, and cricket was slowly being evolved. The use of

the small sword still survived among gentlemen, as duelling was the customary mode of settling affairs of honour. Life and property had now other safeguards than personal prowess. If the trader on long journeys thrust pistols into the holsters, or buckled a sword to his belt, it was merely as a show of defence; in nine cases out of ten his right hand had long lost its cunning.

The present century had almost dawned before our forefathers commenced to lose their indifference to active exercises, and to evince the desire to compete where hitherto they had only cared to patronise. Gentle and burgess now engaged in contests of bodily skill; cricket and rowing grew rapidly into favour; a modified form of archery attracted considerable attention from both sexes; while at the public and military schools, and at the universities, a rough system of physical education was pursued. In the year 1849 the Royal Military Academy held the first annual athletic meeting, other institutions followed, and the extension of the volunteer movement throughout the country rapidly increased their number. A distinction then arose between the amateur athlete, who contended for honour, and the professional, who made his art his livelihood. It is with the former, and the former alone, that my further remarks have to do.

The period had long gone by when war, and the preparation for war, claimed so much of the time of each male subject. The steel of the sword had verily been converted into the ploughshare. The sling, the battle axe, the long sword, the lance, and the long bow were extinct weapons, and their art a lost one. If some warlike exercise remained, it was in an altered form, and had been degraded into a pastime. Of such, of the games stigmatised by Edward the Third as "trivial and useless," and of the time-honoured diversions of swimming, running, leaping, and wrestling, with the addition of a few introduced within recent years, our modern athletic sports are composed. But whatever their origin, or whatever their modification, one

of the motives which called them into existence still survives unchanged and unabated: it is the preservation of health and the maintenance of physique.

(Part 2, Modern Athleticism, will appear in the March number of *HYGIENE*.)

### THE MODE OF PREVENTING THE SPREAD OF EPIDEMIC DISEASE FROM ONE COUNTRY TO ANOTHER.\*

BY SURGEON-GENERAL J. M. CUNINGHAM,  
M.D., C.S.I.

WHAT is epidemic disease, and what are the special forms of epidemic disease with which we are concerned in this inquiry? The term "epidemic" is somewhat vague. It is generally employed in contradistinction to "endemic" and "sporadic." But diseases which are markedly "endemic" in their character often become "epidemic" within the countries where they are specially localised. For example, epidemics of malarious fever are common in countries where such diseases are constantly present. Or if we take other diseases which are not so specially localised, a disease which is ordinarily represented by a few isolated or so-called "sporadic" cases may become "epidemic," and number hundreds or even thousands of cases. Of this, small-pox is a striking example, for even in our own country we find it rise and fall in a very remarkable way—a very few cases in one year, and then a very great many cases in another year. The truth is, these terms, "endemic," "epidemic," and "sporadic," cannot be logically defined, especially the two last of them, which merely mean different degrees of prevalence or absence of disease. Regarding their proper use there is no law, and as a matter of fact they are employed differently by different observers. Cases which one observer describes as merely "sporadic," or altogether independent of one another, would be regarded by

another observer as undoubtedly "epidemic"—as valuable indices of that movement which is characteristic of epidemics, and without mention of which their history would be altogether incomplete. But we need not pursue this subject further. The question we have to deal with is a practical question, and so far as the term "epidemic" in the heading of this paper is concerned—a heading, I may observe, which was given me as the subject on which I might offer to the Congress a few remarks—I apprehend that it is intended to refer to those diseases which are always present in certain parts of the world with greater or less intensity, generally confined to them, but every now and again overleaping their ordinary boundaries and invading other countries from which, as a rule, they are altogether, or almost altogether, absent. In regard to such diseases we have the feature of movement which we have already mentioned as characteristic of epidemics—the disease is heard of as prevailing beyond its ordinary bounds, it is evidently moving, it advances sometimes gradually and steadily, at other times in leaps and bounds, and in every country the question soon arises,—It is coming here, and what can be done to prevent its coming? Practically the only disease to which this description fully applies is cholera. Small-pox is already present. Malarial fevers never invade other countries. Influenza has of late afforded a very striking example of an epidemic, but it seems hard to say where it came from if it be the fact that it came from any special part of the world. Yellow fever, be it of malarial or other origin, has very rarely gained any serious hold over places far from its ordinary home. Leprosy has recently attracted attention as a disease which may be expected to extend its limits under the altered conditions of this closing nineteenth century, but there is no evidence to this effect. Of cholera, however, most countries have had sad experience—of its power there has been abundant proof, and no more important question could well engage attention in regard to epi-

\* A paper read before the International Congress of Hygiene and Demography.



demics than how this power may be most successfully combated. We may, therefore, take cholera as specially *the* epidemic disease with which we have to deal, and it will serve also as a type of all others of the same or similar class; besides the measures which are the best to be taken against cholera will also be found the best where other diseases are concerned.

If it be difficult to define the word "epidemic," it is equally difficult to find a word to express the advance of an epidemic—the increase in the number of attacks, and the extension of the area affected—without involving some theory as to the cause of the disease. When we talk of "spread," although this is as good a word as any, the idea is presented that this cause is something which is being multiplied, that the cases already existing are the cause of other cases, and that these again will be the cause of many more; in the present day, no doubt, this is the popular doctrine both with the profession and the public. The epidemic of cholera is attributed to human intercourse, to the movement of travellers and their effects, or of merchandise in its varied catalogue. There are many who hold that if this movement could be traced back and back it would ultimately end in the discovery of the specific cause which had been exported from its home. They think, moreover, that if all intercourse could be absolutely and entirely stopped, then cholera could never leave the home which it is supposed to have in the delta of the Ganges, and would be just as incapable of appearing in Europe or any other country outside these lower parts of Bengal as any other article of exclusively local production. Now I mention this opinion, not with the object of discussing it, or of raising any discussion upon it, but rather in order to say that I shall not discuss it or any other theory in regard to cholera. I shall confine myself to facts, and from these facts endeavour to deduce an answer to the important question—What is the best mode of preventing the spread of epidemic disease from one country to another?

I mention it also because it forms the basis of the *first* of these modes which I shall consider, the main, and indeed, I might say, the only mode which has been adopted in many countries to protect them from epidemics, and which is known under the name of quarantine. Quarantine in respect to cholera aims at two things; it aims first at preventing the export of a cholera-producing material from any country in which the disease may exist; and secondly, it aims at preventing the importation of such material into another country. It may be divided into land quarantine and sea quarantine, but the impracticability of any such measure by land has now become almost universally recognised, and the attempt may be said to have been given up except when for the time unreasoning panic has seized the authorities and induced them to have recourse to measures which in calmer moments they would never have attempted. Sea quarantine endeavours to attain its object by not allowing ships to enter the port of arrival, and discharge their passengers and cargo, unless they had a clean bill of health on starting, unless they have been healthy during the voyage, and, in the case of vessels coming from suspected places, unless they have been subjected to a certain period of observation, which varies according to circumstances. It is not necessary to describe all the procedure in detail, the confinement of the passengers in lazarettos, and the disinfection of the cargo, and other parts of the system. The question is—Has this system done any good? The answer is, emphatically—No! No case can be adduced in which the exemption of any country can be proved to have been due to quarantine, or, admitting that in a case of this kind absolute proof is difficult and perhaps impossible, no instance can be adduced in which there are good grounds for believing that such exemption has been due to quarantine. The mere escape of any particular place in which quarantine was carried out is in itself no proof that the one was the consequence of the other.

We must remember the fickle nature of cholera, which is exemplified in every epidemic; how it attacks one place and exempts another, it may be close by. Year after year statistics illustrate this characteristic, and show that, even in areas where the epidemic has been severe, a large proportion of towns and villages escape altogether. Every case in which credit is claimed for quarantine because it appeared to have either postponed attack or warded it off entirely must be carefully considered, and the evidence in favour of such a view submitted to thorough examination. I know no case put forward in favour of quarantine which can stand such examination. An island would afford the best illustration, but islands seem only to supply illustrations of its failure, as exemplified in Malta and Sicily, with their oft-repeated epidemics. Australia has been cited as an instance of safety arising from quarantine, as regards both small-pox and cholera. Being an island continent, it is a good case for investigation, and I am glad to see that a separate paper upon it is to be read before this Congress. But if, as I believe, there are no cases in which quarantine has beyond all reasonable doubt succeeded, there are endless cases in which it has signally failed. The history of cholera over the world, and especially in Southern Europe, is a consistent history of the failure of the whole system, and the marvel is that, after so many years of failure, it should yet be upheld and continued in any part of the globe.

The truth is that as it was originally based on theories, so it is continued on theories, with little regard to facts or experience. It proceeds on the assumption that ships are the great means by which cholera moves from one country to another; and, in particular, that if the narrow neck at the entrance to the Red Sea could but be subjected to the strictest quarantine, Europe would be safe from cholera. But, as a matter of fact, ships, especially along this Red Sea route, are wonderfully exempt from

cholera; and the chief ports on this main line of communication with Europe—Aden, Suez, and Egypt generally—have a history singularly free from cholera epidemics, and have enjoyed an immunity from the disease such as few places in the world can boast of. No European epidemic of cholera has ever been traced to this route, even by those who have searched diligently in hope of finding evidence in favour of this conclusion. On the other hand there is ample evidence that several of these epidemics have advanced not by the sea route at all, but by land. The authorities which regulate the imposition and withdrawal of quarantine are very anxious to learn all about the current history of cholera in the East. It is extraordinary how little their action seems to be regulated by what is going on in Europe. Year after year the same vexatious interference with arrivals from the East takes place, when often, at the very time of such interference, cholera is prevalent, and has, perhaps, been for months prevalent on the other side of the Mediterranean. A more or less complete history of cholera exists for the past sixty-two years—1829-1890. As regards many of them the information is defective, but we know that in thirty-nine of them cholera was present in some part of Europe, often very severely, and lasting for great part of the year. To attempt to protect Europe from cholera when cholera was already there, and human intercourse free all over the continent in every direction, is one of those extraordinary proceedings which seem to attach to the unreasoning nature of quarantine.

The freedom of Egypt and of the Red Sea route generally from cholera will doubtless be ascribed by some to quarantine, and will be claimed as an example of the benefits of quarantine. The condition of vessels leaving Indian ports, they argue, is now subject to regulations, they are under inspection all along the route, therefore ships rarely suffer, and the ports where they stop are rarely affected. But, un-



fortunately for this argument, the state of matters shows no change now from what it was before such precautions were taken. The Red Sea Route was opened in 1842; in 1869 a vast increase of traffic commenced with the opening of the Suez Canal, but these changes, great as they are, have brought no changes in the history of cholera.

This point is of great importance, because in these days of rapid communication the advocates of quarantine believe that they have a new and powerful argument in their favour. People and merchandise of all kinds, they say, now pass so quickly from places where disease is prevalent to other places where it does not exist, that there is much greater risk of bringing it than there used to be in the days of slow travelling, and therefore there is all the greater need for strict quarantine. But this argument, like all the other arguments advanced in support of these restrictions, is purely hypothetical, and is opposed to actual facts. These later years of rapid communication have not brought with them more frequent or more rapidly-extending epidemics. Quite the reverse. Whether in India or in Europe experience is the same. The more rapid means of communication have effected no change in the behaviour of cholera. Epidemics of this disease travel no quicker in these days of railroads and steamboats than they did a hundred years ago, in the days of bad roads and coasting craft of the most primitive description. Nor has the direction of epidemic movement been altered. This is true of India, and it is equally true of Europe, where, as we have already seen, cholera has been present in at least thirty-nine out of the last sixty-two years; but in none of these has there been a general diffusion of the disease. In spite of railways running in every direction, and the freest and most rapid communication between different countries, even in these later years cholera has been generally confined to one or two of the many countries of which Europe consists; and there has been no co-

relationship between the extension of cholera and the facilities for human intercourse.

The question with which we are concerned is a purely practical one. If quarantine has really proved beneficial, where is the evidence of the benefits it has conferred? Those who uphold the system are bound to produce such evidence, if they can, to justify its continuance; for if it confers no benefits it beyond all question causes the most serious evils. The delay of travellers, often unexpected and always indefinite, their detention in what is virtually a prison, under circumstances most favourable to disease; these are bad enough, and few experiences in life can be more vexatious. In addition, there is the derangement of commerce, the expense entailed in keeping ships and crews doing nothing for days, and it may be for weeks, and all this ordered frequently at the last moment, so that until actual arrival it is impossible to say whether quarantine will be imposed or not, and if so for how long. Whatever may be thought of quarantine in other respects, there can be no question that if quarantine were entirely abolished the world would be free of many most serious, annoying, and vexatious hindrances with which it now surrounds both travel and commerce.

The *second* mode directed to prevent the spread of epidemic disease to which I shall refer is known as medical inspection. In this system there is no attempt to prevent vessels landing their cargo, but when epidemic disease threatens, vessels coming from countries where such disease exists are inspected, and if any of the passengers or crew are found to be suffering from symptoms of this disease they are isolated and removed to hospital for treatment. This is the system which has been adopted in England, and it has been found to work well. It involves no vexatious interference, and provides both care and comfort to the sick, which must be most beneficial for them. In this respect it is an excellent system, but there is

no evidence to show that the comparative exemption from epidemic disease which England has enjoyed can be properly attributed to it. Quarantine is a much more stringent system than medical inspection. If disease can be kept out of any country by police arrangements, then quarantine is much more likely to effect this object than medical inspection. But, as we have already said, quarantine has signally failed, and it therefore cannot be argued that the less stringent method of medical inspection has proved successful. The comparative exemption which England has enjoyed seems in the main to have been due to another and totally different cause. This exemption is all the more remarkable when we remember the enormous direct traffic, both of passengers and goods, which is carried on between English ports and India, and that a large part of this traffic is with that very delta of the Ganges which is believed by so many to be the source of all the cholera in the world. England, which has by far the largest and most constant communication with this so-called home of cholera is singularly free from the disease. For five-and-twenty years it has enjoyed a most remarkable immunity from it, although during that time many other countries in Europe, as we have already seen, have suffered, and some of them suffered severely.

And this brings us to consider the *third* and best mode of preventing the spread of epidemic disease, the only one in fact on which any reliance can be placed. I mean sanitary improvements—pure air, pure water, good drainage, proper food and clothing, with suitable dwellings, and the many other requisites of good health which might be arranged under these great heads. These are the best and only safeguards against epidemics, be it of cholera or any other disease, and not only against epidemic disease, which comes only at intervals, but also against the ever present though less alarming ailments which make up the annual death-rate. That such improvements have largely reduced

the mortality from cholera there is incontestable evidence. The believer in human intercourse and specific contagium will say, "Yes, I grant all this, but the explanation is that in a good system of water-supply the specific poison is kept out of the water, and by good drainage and conservancy it is carried off and not allowed to lodge in the soil, and this is the reason why cholera is prevented." To this I would reply that I have advanced no theory of cholera causation. I base the recommendation of sanitary improvements purely on practical experience. I would say to everyone who has a theory as to the cause of cholera or any other disease—experience has proved beyond all doubt the benefit of sanitary improvements. You are welcome to adopt any theory you please as to the manner in which these improvements act in preventing disease. The great point on which all are agreed is that they do exercise the most beneficial effect in this respect. Let us unite, therefore, in urging the necessity for such improvements. What is wanted is practical work, the theory on which it is based is a matter of very minor importance.

I have spoken of the great evils of quarantine, but there is one of these evils which I have not yet mentioned and which is the greatest of them all, and it is this—that quarantine tends to the utter neglect of these sanitary improvements. If people believe that they can keep out the disease-producing cause, and that if they succeed in this they are perfectly safe, what inducement is there to carry out such improvements? The call is rather to impose greater stringency in their quarantine arrangements. If these failed before, it must have been because they were not sufficiently strict; and so the ports are guarded more rigidly than before, and travellers and commerce are subjected to even more vexatious and annoying regulations than ever. But the result is the same—disastrous failure. Quarantine thus not only promises a protection it cannot afford, but it diverts attention from the only real protection



that can be provided. Time and money and people's patience are wasted, and all to no purpose, the real evils to be grappled with are left untouched.

I commenced with a remark on the terms "epidemic," "sporadic," and "endemic," and I shall close with this other remark, that far too much importance is attached to these terms. They are often employed as if they meant something really definite, and as if the determining of them in each particular case added to our knowledge of the disease concerned. I remember well the frequent inquiries which the Constantinople Board of Health used to make of the Government of India as to whether cholera at some particular place was "endemic," or "epidemic," or "sporadic," because they believed that their quarantine regulations could not be properly framed without this information, and how they sometimes complained afterwards because they thought that one of these terms had been used when another ought to have been employed. Often have I felt inclined to point out to them how much better it would be if they ceased to trouble themselves about our state in India, and concerned themselves with the state of their own countries, and more especially with the drainage and water-supply of their towns, which in many quarantine lands are so neglected. And to every country, and more particularly to those which still believe in quarantine, I would say the same thing. Look to your own state, for in sanitary improvements you have the best and only safeguard against cholera and other epidemics, and not only against them, but against all the other diseases which are more or less always with you. And in carrying out these sanitary improvements you will have the further satisfaction of knowing that they involve no interference with personal liberty, no restriction on trade or travel—not one, in fact, of the serious evils and innumerable vexatious annoyances which are the necessary accompaniments of quarantine; but that, on the other hand, they will contribute greatly, not only to the health, but also to the convenience and comfort of the people.

## RECENT HYGIENIC IMPROVEMENTS IN BREAD MAKING.

By JOHN GOODFELLOW, F.R.M.S., Professor of Hygiene and Physiology at the Bow and Bromley Institute; author of "The Dietetic Value of Bread"; Hon. Consulting Chemist to the Master Bakers' Protection Society.

BREAD is such a universal and important food that any improvements in its manufacture and quality deserve recognition and consideration, and should prove interesting to all hygienists. It will be convenient if the subject be divided into two parts: 1. Improvements in wholemeal bread. 2. Improvements in other breads. The limits of this paper will not allow me to fully enter into the subject of the dietetic value of ordinary wholemeal bread. I must content myself with remarking that from many experiments performed on myself, my assistants, and young animals, for the purpose of my work on bread as a food, I have come to the conclusion that ordinary wholemeal bread is not a desirable food, and acts injuriously on the intestinal tract, by unduly stimulating the muscles and nerve-centres of the bowels.

The chief objections to ordinary wholemeal bread as a food are: 1. The large percentage of waste, averaging about  $12\frac{1}{2}$  per cent. 2. The increased waste of other foods produced by the ingestion of wholemeal bread. 3. The unpleasant taste produced by the comparatively flavourless particles of bran. 4. The irritating action of the bran. 5. The rapidity with which wholemeal bread becomes dry and stale.

The large percentage of waste is a most serious objection to ordinary wholemeal bread, especially if it be taken in large quantities. It constitutes a loss of energy to the body, inasmuch as force is used to digest the extra quantity of food which must be taken to equalise the waste. The waste in fine white bread only amounts to about  $4\frac{1}{2}$  per cent., so that wholemeal bread is not nearly so thoroughly digested as white bread. I have

ascertained that not only does wholemeal bread itself contain a larger quantity of waste, but that its ingestion leads to an increase in the waste of other foods. In a subject experimented on by myself, in December, 1890, it was found that when milk alone was used as a food the waste averaged about eight per cent. When ordinary wholemeal bread was used with the milk, the waste in the milk rose to nearly eleven per cent.

The irritating action of coarse wholemeal bread depends on the bran. The muscles of the intestines are disposed of in two layers, and their contractions partly depend upon nervous impulses which originate in the ganglia and nerve-plexi, situated in the wall of the bowel. It is probable that the muscles themselves naturally respond to direct mechanical stimulation. The movements are automatic, inasmuch as they are entirely independent of the central nervous system, though they may be influenced by afferent impulses passing down by the pneumo-gastric nerve.

The coarse bran particles act as mechanical stimuli, both to the nerve centres and the muscles, and unduly increase the peristaltic action of the intestines. The stimulation often passes beyond the innocuous stage, and severe diarrhœa may be brought on by the excessive irritation produced by the bran. The writer has found indications that the villi of the intestines may be considerably modified by a continued ingestion of coarse bran. The microscopic appearance of the layer of columnar cells which covers each villus is different to that of the normal. The cells are not so regular, and the striation of the border is nearly lost, while the peripheral portions appear to become hardened. The writer believes that this modification may have an effect in reducing the absorbing power of the villi.

Many medical authorities assert that slight chronic inflammation may result from the continual ingestion of coarse bran, and the writer must certainly say that, over and over again,

the post-mortem appearances of the animals he has experimented upon have been quite compatible with such a view. The unpleasant flavour of coarse wholemeal bread is partly caused by the bran particles, which produce in the mouth an acute sense of *touch*, but not a very decided taste. Some students undertook to test this point under the writer's direction, and they affirmed that flavourless particles very materially altered the taste of nearly every food tried. They found, also, that the finer the particles the less they affected the flavour of the food with which they were mixed. The last objection is an important one. Very few people can partake of a stale wholemeal loaf with any degree of pleasure.

It is well-known that staleness is not altogether due to a simple evaporation of water. There is a molecular change which goes on slowly, and which is an important factor in producing a stale loaf. In ordinary wholemeal bread these changes go on very rapidly, and the bread after twenty-four hours is comparatively flavourless and distasteful. The first four objections depend on the presence of coarse bran particles. It appears that very fine particles of bran do not produce such undesirable effects on the body as those which have been ascribed to coarse bran, so that the hygienic, improvements in wholemeal bread must necessarily take the form of—1st. Obtaining a *fine* bran in the loaf.—2nd. The preparation of so *dry* a meal that the bread takes up a large proportion of water, which is so intimately incorporated with the constituents as to delay those internal changes which result in a stale loaf. Other minor improvements may also be referred to, affecting the digestibility, purity flavour, &c., of the bread.

*Number 1. Triticumina Bread.*—This is a special wholemeal bread in which the bran particles are very fine, and shows what can be done in this direction. It is prepared from a special meal, ground by powerful steel machines in which the bran is literally cut up into fine



particles. The waste in this bread, as ascertained by personal experiments, is only  $7\frac{1}{2}$  per cent., as compared with  $12\frac{1}{2}$  per cent. in ordinary wholemeal bread. The bran is so fine that it does not irritate the intestines like the coarse varieties of brown bread. That it is perfectly possible to manufacture wholemeal bread which shall keep moist for two or three days is proved by the fact that this bread is palatable and soft after being kept three days. This is not only due to the moisture which it contains, but also to the large proportion of *soluble* matter present. The flavour of the bread is very pleasant owing to the large quantities of sugar and dextrin which it contains. This bread is also distinctly very digestible. The starch is in a very assimilable condition, and there is about 50 per cent. more soluble matter present than in ordinary wholemeal bread. This very desirable result is obtained by allowing the grains to undergo the first stages of germination, and subsequently kiln-driving at low temperature.

*Number 2.* "Cyclone" bread is very interesting as marking a new departure in the preparation of wholemeal. The wheat grains are pulverised in sealed chambers by means of air-currents produced by fans rapidly revolving in different directions. The grains are reduced to a state of fine division by their own momentum, and the result is a fine wholemeal. The advantages of this method are many. In the first place the meal is thoroughly aerated, and, secondly, there is no metallic or stony adulteration. Thirdly, the meal is very free from microbes and other aerial impurities, for the air is filtered before being delivered to the chambers.

These two specimens demonstrate the possibility of manufacturing wholemeal bread in which the bran particles are so fine as to entirely obviate any irritating effects. There can be little doubt that until such fine wholemeal bread is universally forthcoming, people will do well to partake very sparingly indeed, if at all, of the coarse wholemeal bread, which is now so commonly supplied to the public.

#### *Improvements in non-wholemeal Breads.—*

These may be divided into: 1. Improvements in white bread. 2. Improvements in brown bread. White bread is certainly deficient in proteid material, fat, and mineral matter. The reason of this is well known. Fine white flour is obtained chiefly from the centre of the grain, and the bran and the germ are rejected. The bran and the germ are the portions of the grain richest in proteids, fat, and mineral matter, while the central part is poor in proteids and phosphates, and rich in starch.

Hence it follows that bread made from fine white flour is also deficient in nitrogenous matter, fat, and inorganic constituents, and is correspondingly rich in starch. Any process therefore, which secures: 1. A higher percentage of proteids; 2. A higher percentage of fat; 3. A higher percentage of phosphates; may be regarded as an hygienic improvement in the quality of the bread. Many eminent authorities on food regard starch, even when gelatinised and broken down, as difficult to digest, especially by children.

There appears to be a consensus of opinion that if a larger percentage of our carbohydrate food took the form of soluble bodies (sugar and dextrin) there would be a considerable gain from such a substitution. Any process, then, which secures this may also be regarded as an hygienic improvement, inasmuch as the bread would be more digestible. The standard ratio of nitrogenous matter to carbohydrate material may be taken as 1 is to 3.2 (based on Professor Corfield's standard diet.) The ratio in ordinary fine white bread is as 1 is to 7.

*Number 3.* Black's Fermented Bread is a white bread which is characterised by a high percentage of nitrogen. This result is obtained by a special process in which "strong flours" are taken and formed into dough, and then treated with lime-water. The gluten is concentrated, and part of the starch precipitated, so that a dough is obtained very rich in proteid

material. The dough is then added to ordinary dough, and the result is a mixture with a very high proportion of albuminoid matter. This characteristic is obtained without any deterioration of texture or flavour. The ratio of nitrogenous matter to carbo-hydrates is as 1 is to 3·6, very near the normal. This bread, though white, has quite as high a percentage of proteid material as fine wholemeal.

*Number 4.* Fletcher's Diastase Bread is a variety with a very high percentage of soluble carbo-hydrates, chiefly in the form of maltose. The starch is also in a very assimilable form. The bread has a very fine texture, and is one of the best flavoured of the white breads. This bread, also, keeps moist far longer than ordinary white bread, for the diastase so acts on the starch as to produce soluble bodies which confer this characteristic on the bread.

The ratio of nitrogenous matter to carbo-hydrates is about the same as in ordinary fine white bread, but the bread is far more digestible, containing quite 80 per cent. more soluble carbo-hydrates. This result is obtained by the addition of "diastase" to the dough. Diastase, I need hardly remark, belongs to the class of ferments known as the *enzymes*, which have the power under certain conditions of producing from indiffusible substances, soluble bodies with a high osmotic equivalent, without undergoing any material change themselves. Diastase acts on the starch, converting it into several forms of dextrin and sugar.

The whole series of intermediate changes have not yet been fully worked out, but it appears that maltose is chiefly formed as a final product, and one of the saccharo-dextrins. The diastase does very little work during the doughing stage, but when the dough is introduced into the oven it rapidly acts on the gelatinised starch, until its power is destroyed by the heat of the oven. The writer has ascertained that 15 minutes is the average time during which the ferment acts on the starch in the oven, quite long enough for the diastase to produce a considerable quantity of sugar.

*Brown Breads.—Number 5.* Frame Food Bread.—This bread is made from ordinary white flour, to which an extract of bran is added. The extract is prepared by mechanical means from the bran, and consists of the following bodies: Water, 9·58; carbo-hydrates, 58·33; proteids, 21·40; mineral matter, 10·69; total, 100·00. The mineral matter is very rich in alkaline phosphates. The extract may be added to the dough either as a powder or as a liquid.

The object of the addition of the extract is to get a loaf having the same composition as wholemeal bread minus the bran particles. The ratio of proteids to carbo-hydrate is as one is to 3·9, very much higher than in the case of fine white bread, and the bread contains 50 per cent. more mineral matter, consisting chiefly of phosphoric acid and potash.

*Number 6.* Germ Bread is manufactured from "germ" flour. Germ flour consists of about 75 per cent. of ordinary white flour, and 25 per cent. of the germ. The germ being the embryo of the *Triticum* is rich in proteids, fat, and phosphates, and its retention in the flour adds materially to the nutritive value of the bread. The germ is specially treated in order to destroy the ferments and the bitter principle found in it. This bread is very rich in proteids, and contains far more fat and phosphates than ordinary bread. The ratio of proteids to carbo-hydrates is as 1 is to 3, slightly higher than the normal.

*Number 7.* Health Bread. This variety contains all parts of the wheat grain except the outer layers of the bran. The bread is thus free from irritating particles, while it retains the nutritious elements of the wheat. The ratio of nitrogenous matter to carbo-hydrate material is as 1 is to 3·6. The process of preparation of the meal secures the rejection of the outer layers of the bran, consisting chiefly of woody fibre, while the inner layers containing the nutriment are retained and finely granulated.



I have only time to mention the existence of various malted breads, prepared by the addition of malt extract to the dough. Such breads are better flavoured and more digestible than ordinary bread, and there is very little risk of sourness. The malt favours quick fermentation, so that the souring germs are never allowed to develop in the dough, owing to the vigorous growth of the yeast, and a minimum production of alcohol. The working is also cleaner, for potatoes need not be used when malt extract is employed.

Machine-made bread is coming more and more to the front, and rightly so; such bread is surely to be preferred to hand-made bread, with the possible contingency of contamination from the bodies of the half-clad operatives. When it is impracticable to put down an extensive plant, hand-machines are used now in most bakeries, including such contrivances as kneaders, dough dividers, potato washing machines, flour blenders, &c. The sanitary condition of bakehouses has of late years undergone much improvement, and it is rare indeed to find nowadays dirty and unhealthy premises used for the purpose of bread-making.

### THE POWER OF SOIL AND VEGETATION COMBINED TO DESTROY DISEASE GERMS, AND SO PREVENT THE POS- SIBILITY OF THE SPREAD OF EN- THETIC DISEASE IN CONSEQUENCE OF SEWAGE FARMING.

By ALFRED CARPENTER, M.D., J.P., Vice-President, British Medical Association, Examiner in the University of Cambridge, &c.

At the meeting of the International Medical Congress in London, in 1881, I had the privilege of introducing to the notice of the members the subject of sewage utilisation by means of irrigation. I submitted certain propositions, and the evidence upon which they were based, viz., the practical experience of 21 years' personal observation upon the Croydon sewage farms. A

further experience of 10 years gained by closely watching the same farms (the areas being increased) has fully confirmed every word put before the great assembly of 1881. No essential part of that evidence has been successfully assailed, and every word might be repeated here if it could be done without loss of time. I will renew the propositions, so far as they bear on the power of soils to destroy the germs which in other positions are capable of spreading infectious disease.

Proposition 1.—That the judicious application of sewage in close proximity to dwelling-houses does not depreciate the health of the inhabitants.

The population of Beddington and Wallington, both of which places adjoin the Croydon sewage farms, has increased in a very rapid ratio, which is the more manifest when compared with that of 1861. The census of that year gave a population for the combined districts of 1,557, and a ratable value of £11,700. Notwithstanding the existence of the sewage farm within the distance of less than a mile from the extreme limits of the district, there has been a rapid increase in both population and ratable value. The high birth-rate has naturally raised the death-rate, quite independently of outside influences, and the zymotic rate includes diseases such as whooping-cough, which cannot be laid to the charge of the farm.

Proposition 2.—That the judicious application of sewage to land will satisfactorily cleanse the effluent water, and fit it for discharge into any ordinary rivulet or water-course.

Recent analyses of the Beddington effluent show that after 31 years' continuous application of sewage to the same land, there is a persistent power in that land to deal with the applied sewage as satisfactorily as was the case when it was examined by the Rivers Pollution Commissioners in 1867, as reported to Parliament. It may be that the effluent has not been at all times equal to these analyses. Errors of management, absence of manager, great rain-

fall, cleansing of carriers after hay-making or grass-cutting, and the flushing which has to take place after such cleansing, tend for the moment to make the effluent chemically less satisfactory; but in no case has this been more than an accident, which can be, and has been, easily remedied. I need not labour at this proposition. Its truth has been abundantly demonstrated at other places besides Croydon, though not over so long a period of time, and chemical analyses of a highly satisfactory kind have been published in the sanitary journals.

Proposition 3.—That vegetables from fields continuously irrigated by sewage are satisfactory food for man and beast; that animals fed mainly on sewage produce are as healthy as animals fed on ordinary agricultural produce.

I prove this by the emphatic statement that no evil effects have been shown to have followed from the consumption of the food which has been grown upon the 600 acres of land irrigated by the Croydon sewage, or on the twelve hundred acres irrigated by the Birmingham Corporation. The immense quantities of food in the way of meat and milk resulting from these large areas must have shown evidence of their unsoundness, if any had really existed. If, in addition to this, I take the evidence afforded by medical superintendents of lunatic asylums, such as that given in September by Dr. C. E. Saunders at Haywards Heath, and Dr. Moody at Cane Hill, it will not be necessary to write more to refute the imaginary notions of those who assume that sewage grown produce must be unwholesome.

Proposition 4.—That excretions of those suffering from infectious and epidemic disease, when distributed upon land, as in broad irrigation, are immediately rendered innocuous.

If rightly dealt with they cannot spread such diseases to those employed on the farm, or injure those who consume the produce, or set up similar disease in those living on the confines of the farm. No evidence has been adduced to contradict this proposition. I

append extracts from the annual reports of the medical officer of health, who, acting for the rural sanitary authority, was not under the jurisdiction of the Croydon authority, and therefore gave an independent opinion.

Mr. Cressy reported (Lady Day, 1883): "I have to report for the year 1882, an immunity from fever of every kind. The area reported on includes an asylum of 170 girls from 8 to 16 years of age, which has a remarkable freedom from zymotic disease." This paragraph refers to the Beddington Female Orphan Asylum, a building containing nearly 200 occupants, and placed at the south-west corner of the farm, separated by a small brook from fields frequently under irrigation; while a north-east wind carries with it any miasma produced by more than half a mile of irrigated land.

In 1883 there was no outbreak reported except one, which the medical officer considered to have been caused by polluted water. There were two cases of enteric fever resulting in one death.

In 1885, six cases of diphtheria were reported as arising in South Beddington, in houses at a high level on the chalk (a point the most distant in the parish from the farm) traced to local sanitary defects.

As to 1886, Mr. Cressy reports: "There has been no outbreak of zymotic disease. A case of diphtheria did arise which was imported, but there was no extension." Mr. Cressy, taking a survey in concluding his report says: "The district has been very free from infectious disease."

In 1887, two cases of typhoid, one being fatal, was reported, and referred to dirty, hand-flushed w.c.'s. "The record, as far as infectious disease is concerned," says Mr. Cressy, "speaks for itself."

In 1888, he says: "I find the health of my district even better than last year."

These reports corroborate the view put forth in 1881 to the fullest extent. It is true that a new medical officer of health has been





was added. Microscopic examination of the effluent failed to discover any of these organisms in the liquid, even after it had been kept for three days. The best time to see the reason of this exemption is about the time at which the plant comes into flower. If the surface of the field is then closely examined, it will be seen to be covered by a felt-like mass of minute radicles extending from the plant at the point at which it is attached to the soil. As the sewage is applied, the rootlets seem to be endowed with life, to become mobile; the bacteria adhere to them as they pass with the sewage through the living filter, and if these rootlets are examined through a magnifying glass, the germs are seen in an hour or two to disappear from view, as if digested by the plant itself. Hence I have presumed to apply to rye grass the term carnivorous.

It is by this natural process that the ova of disease germs are removed from the sewage, and the effluent satisfactorily cleansed. A similar result occurs when vegetable life is not active. The ulmic salts in the upper part of the soil have an attraction for living organisms similar to that existing in living vegetable root fibres. This humus is only to be found on the surface of the field, and this is the reason why sewage must not be allowed to filter deep into the soil. Intermittent downward filtration is not safe in its results, because the cleansing power of the humus may be overcome, and disease germs escape with the effluent.

A microscopic examination of the soil from Beddington showed myriads of living organisms within the first three inches of the surface. At a depth of one foot there were found not to be more than a tenth part of those nearer the surface. At two feet deep they were much less numerous; at the depth of a yard they were sometimes absent altogether, though the surface had been irrigated, more or less, during the whole of the year preceding that in which these experiments were carried out. The bacteria

found in the soil evidently feed upon the organic matter contained in the sewage, and change it into elements fitted for plant use. It is thus that nature protects us from the natural consequences of animal existence. We have only to see that the laws of the universe are obeyed, and we then escape from the incidence of those diseases which disobedience entails. At the same time we grow increasing quantities of food for those who produce the sewage.

Proposition five, therefore, is—Sewage when kept in motion and quickly brought into contact with soil and vegetable life is changed in a direction contrary to that which is necessary for the propagation of disease germs. It has been asserted that parasitic diseases are spread by sewage farms. I persistently searched for evidence of this before the year 1875, and have continued my observations since. I have not met with cases of *tenia solium* or of tapeworm in Croydon; there is no evidence of their existence in the case books of the medical officers reporting to the destitution authority. If cases had existed, some notice of them must have been found. I placed a mass of evidence on this point in the hands of the late Dr. Cobbold, and invited him to come down and examine for himself a large herd of oxen about to be slaughtered, which had been bred and grown on the Croydon farm. Dr. Cobbold at that time was in bad health and could not come; but, in a letter to me, he withdrew the charges he had made, suggesting possible evils attendant on the establishment of sewage farms.

A microscopic examination of the flesh of those animals did not show a particle of evidence in support of the allegations.

To conclude, I have put forward a survey of every point bearing on the hygiene of sewage-farming, and I claim to have proved that the utilization of sewage in the manner indicated is a national advantage.



## COTTAGE HOMES FOR THE INDUSTRIAL CLASSES, IN THE NEIGHBOURHOOD OF LARGE CITIES.

BY ROWLAND PLUMBE, F.R.I.B.A., D.S., F.S.I.,  
Architect to the Artizans', Labourers', and  
General Dwelling Co., Limited.

*(Concluded from page 29.)*

In the general view of the terraces of the first and second class houses, as will be seen, a feature in the design is made of the corner houses; and with a view of breaking up the monotony of the long lines which terraces in streets produce, specially designed features are introduced at intervals so as to break up and improve the sky-line of the buildings; advance is also taken of these features to improve the accommodation of the houses, so that a return may be obtained for the extra outlay by an increased rent, which is readily obtained in such cases.

The houses are all built with a layer of concrete over the whole area of the buildings; the walls are of brickwork, the party walls being hollow or 14 in. thick, to prevent the passage of sound between the tenements; slate and cement damp-proof courses are used; the walls are faced with red and yellow bricks, with terra cotta or artificial stone cills and flower guards; the roofs are mostly slated, but to give variety many are tiled; the whole being built with the best materials and designed to have a bright and cheerful appearance. The space under the ground floor, is specially ventilated, as are also all the rooms, Tobin tubes and deep inner beads to windows being provided to each room. There is a constant water supply, and no cisterns are used except the water waste preventors to the water-closets. The sanitary arrangements are of approved yet simple character, all waste and other pipes being discharged over open trapped yard gullies. No soil or rain water drains run through the houses, as the pipes are carried along the back gardens, and

are provided with ventilated manholes for inspection and flushing at suitable distances. There are also similar manholes at the junction of these drains with the pipe sewers in roads.

The general requirements of the inhabitants have been studied. Already the estate has been formed into a separate parish, and a church has been built holding 850 on the ground floor, with mission hall, parish rooms, and all the usual church societies. Building sites have been offered for churches of other denominations; a fine board-school has also been built; various social clubs already exist, as also cricket, foot-ball and other clubs; space is reserved for a public hall, should it ever be required, and every facility will also be given for the erection of polytechnics and other buildings for technical education; also for free libraries, swimming baths, and other similar buildings, whenever the authorities are ready to put the various Acts of Parliament providing these buildings into operation. On the other estates, halls for the use of the inhabitants have been built, but they are so little used, that there is but little encouragement to repeat the experiment. In certain parts shops have been built, also stables; and space is reserved for workshops and laundries.

Although it is not thought advisable to interfere directly with the conduct of the various societies that have sprung up, yet the managers of the estate are always desirous of helping them forward when once started by the tenants. With this object prizes are given, and other facilities granted in aid of the same. Some of the land not yet built upon is used for cricket and recreation grounds and also allotment gardens, and it is hoped to reserve permanently enough land for this purpose. In order to promote thrift and self-respect, the estate is managed on the lines first indicated in the first part of this paper, and no public-houses or pawn-brokers' shops are allowed on the estate.

The estate is occupied by young married people, a few retired tradesmen with moderate

incomes, travellers, warehousemen and clerks, railway employés, tradesmen's assistants of all kinds, artisans of all classes, cabmen, letter carriers, labourers, policemen, pensioners, &c. The inhabitants are healthy, and but few complaints are made. The death rate on the Company's estates from January to end of June last was about 14.41 per thousand, per annum, as compared with a death rate in the general district of about 15.25 per thousand.

In respect to co-operation by the tenants in the development of the Company, but little can, at present, be said; every opportunity is given to them to invest, but only a few shares are held by them.

It is believed this estate would have been by this time completed had proper railway facilities been provided. There are cheap workmen's trains from the Great Eastern station, on the estate, and from the stations on the Great Northern Railway, not far distant, but these early morning trains by no means cover the necessities of the industrial population. It is a fact not generally known that, except on the Midland Railway, the third-class passenger, who is packed closely in his carriage, and allowed to travel but once, backwards and forwards, on six days of the week, actually pays, on an average, about as much for his railway fares as a first-class passenger, who, having a season ticket, can travel as often as he likes in comfort, and has also the right to travel on Sundays.

That there is nothing impracticable in the granting of third class season tickets, is shown by the example of the Midland Railway. This line, as is well-known, has no second class, but its first and third class passengers are treated with perfect equality, with regard to season tickets. What is urgently needed is cheap workmen's trains throughout the day, and failing this, the issue of third class season tickets, at cheap rates, in proportion to the other classes.

In regard to general statistics, it may be interesting to know that an average of about 25

houses per acre are built upon the estate, including space for roads, and that the population is at the rate of about seven people per house, so that when it is completed it will contain a population of about 17,500. There will then be over five miles of roads and streets formed. The outlay, including the land, up to the present time has been about £460,000, and the net income is now about £21,000, so that the estate, (although only about half developed) already pays over  $4\frac{1}{2}\%$ .

The estate is one of four held by the Artizans', Labourers', and General Dwellings' Company (which holds other properties), whose assets are over two millions sterling. The company has for years paid a dividend of five per cent. to its original shareholders, and the shares are now issued at a premium of about ten per cent., to pay four and half per cent. dividend. The market price of the stock is above this.

I trust I have demonstrated in this article the possibility of providing for our industrial classes, bright, cheerful, well-arranged, commodious, healthy, and self-contained cottage homes, under the best sanitary conditions, at a cost which will adequately remunerate the promoters of such good work.

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## A NEW METHOD FOR THE DISPOSAL OF SEWAGE; WITH SOME REFERENCES TO SCHEMES NOW IN USE.

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By C. G. MOOR, B.A., CANTAB.

### I.

In concluding a paper on methods of sewage treatment read at the Congress of Hygiene and Demography, Dr. Thresh asked this question: "Do any of the processes mentioned, or any combination of such processes, enable us to get rid of our sewage in such a way as to give rise to no nuisance, cause no danger to health, and this at a cost sufficiently reasonable, considering the importance of attaining such results?"

In the opinion of most experts at the present



day, the only answer that can be given to this inquiry is an emphatic negative.

We can see this from a brief consideration of those methods that are now in use; they may be divided into three classes:—

1. Lime processes.
2. Processes in which lime is not used.
3. Irrigation.

1. The first of these classes may be briefly disposed of. The lime is used either alone or in combination with aluminous salts, or as in Hanson's process with the so-called sulphurous powder. In each of these cases a good effluent is the only thing aimed at, as the sludge is worthless.

It is also worthy of notice that where lime has been used to precipitate, it must also be added to press with. Under this head also comes the Amines process, in which herring brine is added to the lime with a view of sterilizing the sewage.

2. Processes in which lime is not used.

The best known of these is the A. B. C., in which the sewage is precipitated by a mixture of clay, alum, and charcoal, with a little blood. A clear, inodorous, and tasteless effluent is produced, and the sludge is pressed without lime, dried and ground; it is stated to contain 3 per cent. of ammonia and 5 per cent. of phosphates; both of these figures seem high if the manure sold has not been enriched by ammonia or phosphate. Much has been said for and against this process; at any rate it is better that the sludge, whatever it contains, should go on the land than have to be thrown away as sometimes happens in the lime processes.

The International Sewage Purification Company precipitate with a mixture of magnetic oxide of iron and salts of iron, alumina, and magnesia. The effluent is further purified by passing through a filter bed of gravel and polarite. The sludge, when pressed without lime and dried, readily crumbles into a fine powder, and should be of some value as manure.

Webster's process, or electrical treatment.

The sewage travels along a trough in which

are placed iron plates connected with the terminals of a dynamo. Water is decomposed and some iron also passes into solution, precipitation takes place, and the effluent is said to be good.

3. Irrigation.

In cases where land is cheap and of suitable character this plan may be adopted with success. In most cases the first cost is great, and so is the cost of maintenance. It is a disputed point as to whether parasites may not be communicated to the animals feeding from the crops raised off unfiltered sewage, and it is certainly not advisable, as is sometimes done, to irrigate fields with untreated sewage, so that pools of putrifying matter are formed round which cattle are feeding.

In the case of London it would be practically impossible to get land enough to deal with the enormous volume of sewage, which is very greatly increased in wet weather, and though it may be said that this is in great part rain water, yet the dirt washed off the streets and the fungus torn from the sewers by the increased volume of water will render some method of treatment as necessary as if it were ordinary sewage.

## II.

And now to come to the subject of this paper; the treatment I have to bring forward has been practically tested by me at experimental sewage works at Leyton. I have no very novel suggestions as to the precipitation of sewage, the originality of my method depending on the manner in which the sludge cake, produced by any precipitation process, may be converted into marketable products.

Let us consider the ordinary composition of sludge cake; it is roughly in 100 parts,

Water .. .. . 25

Inorganic matter containing phosphates 20

Combustible matter containing nitrogen 55

The above figures refer to sludge cake that has been dried by exposure to the air for some days.

Now suppose we could afford to distil the cake in gas retorts we should save the ammonia; but it would not pay, unless one could produce a sludge very rich in ammonia, and then it would be saleable without further treatment. There is, however, a cheaper way of distillation than that I have just mentioned. Mr. Rees Reece, in a patent a good many years old, described a method of obtaining tar, ammonia, acetic acid, and inflammable gas from peat; this process was in successful operation for some time. He employed a kind of lime kiln with a forced draught, connected with a series of condensers. The operation was conducted in such a manner that the material in the lower part of the furnace was kept in active combustion, its heat distilled the material directly above, and this in its turn gradually descended to serve as fuel for the succeeding charge. Thus nearly the same effect was produced as if the peat had been distilled in retorts, except that instead of carbonised matter ash was obtained. I have employed the same method for dealing with sludge cake and have made experiments on a sufficiently large scale to show the possibility of practical working. A furnace was set up built of boiler plate, lined with brick and fitted with a fan and condensers; this was kept burning for three weeks continuously, during which time it was fed with sludge cake alone, and this sometimes contained more than 30 per cent. of water, as some came straight from the press. The sludge gives ample heat for its own distillation, and might also be used to raise steam in the same furnace if desired.

The ammonia comes over with the liquor just as in gas works, together with a quantity of light buttery tar which floats on the liquor. The cakes are reduced to a fine ash, which if the temperature is raised by increasing the blast, can be changed into clinker. A very slight blast is sufficient to distil with, merely enough to get the products of distillation through the condensers.

Now the first question that will suggest itself is, what portion of the theoretical yield of ammonia is actually obtained?

Eighty per cent. was what I actually obtained with the apparatus I had there, and it is at least probable that more could be obtained with better apparatus.

If the blast is carefully regulated the uncondensed gases will burn, being of similar composition to what is termed "producer gas;" this might be employed in raising steam to drive the fan, pumps, etc., working up the ammonia liquor, or distilling the tar. I had originally intended to mix the ammonia, fixed as sulphate with the ash to form a manure for general purposes; this cannot be done if there is much free lime in the ash as ammonia is disengaged too readily.

Here perhaps I ought to state the reasons which compelled me to give up working at Leyton (where I was treated with great kindness by the authorities). The first reason was the low value of the ash, which contained about 60 per cent. of calcium salts. This great excess is due to the addition of lime first to precipitate and afterwards to press with.

The lime also introduces another difficulty, and that is the production of clinker in the furnace. The temperature of the furnace must of course be kept up to that point at which inflammable gas is produced, and when this is done it is hard to avoid a certain amount of clinker being formed also.

In the case of some towns where clinker can be used this might be done, and the ammonia alone relied on as a source of income, since sludge cake, even as produced at present, will yield enough ammonia to do more than pay for its distillation in the manner described.

The uncondensed gases from distilling or baking sludge cake have an exceedingly unpleasant smell, and must be burnt to avoid creating a nuisance.

Some time ago experiments were made of burning cake made from London sewage in a



kind of oven, built with partitions so that the heat from one assists the one next to it, fires being lighted successively. The cake burnt without difficulty, but the ash being of little value it was abandoned. I believe no attempt was made to collect the ammonia.

A few years ago some ovens were tried at Leyton, for burning the sludge cake to obtain ash; the experimenters either did not attempt or were unable to obtain the ammonia.

There was little or no sale for the ash, and this process was subsequently abandoned.

### III.

As regards a method of precipitation to go with the method of utilizing sludge cake which I have just detailed, it is obvious where a separate system is used for storm water the ash will be worth more, as it will not be so contaminated with silica and other mineral substances from the roads.

Of course what is wanted is a means of producing a sludge cake as rich as possible in ammonia and phosphate, at the same time without adding precipitants in any large quantity, which would lower the percentage of phosphate in the ash. At the same time the pressing ought to be done without lime. This is possible, as it is done at Kingston.

I have not been able to make experiments on this subject, but it seems certain that the use of lime ought to be avoided at all costs, and I should be inclined to try carbonized sludge in powder mixed with salts of alumina and iron, after precipitation running the liquid through a bed of lumps of carbonized sludge; when this bed is too foul to use any longer it can be burnt in the furnace.

I was not successful in preparing carbonized sludge in the same furnace that I have spoken of, though I think it could be done in a larger one. The attempt was made to rake out a portion of the sludge, after being carbonized, but before it was burnt to ash. At any rate if this cannot be done, the cost of carbonizing sludge

in closed retorts heated by the inflammable gases I mentioned would not be prohibitive.

It seems probable that by using a sufficient quantity of this carbonaceous material (which can so readily be renewed) a considerable degree of purity could be arrived at in the effluent.

Any seeds present in the sludge, which are sometimes very numerous, are of course destroyed in the furnace and any vegetable matter is reduced to ash, so that potash contained in the solids suspended in the sewage is rendered available.

As to what proportion the resulting manure, if the whole of my scheme were in operation would be by weight to the cake dealt with, it is not possible to speak with accuracy; it might probably be one-tenth.

At the present day it is fast becoming widely felt that it is the duty of towns to treat their sewage in some way, so that no injury may be caused to health, yet we surely ought not to rest content with processes which yield nothing but refuse. It is now many years since Liebig insisted on the need of maintaining a proper circulation of phosphates and ammonia if we wish our land to remain fertile, and this need, instead of diminishing, shows itself more clearly every day.

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## THE USE OF STEAM IN WEAVING FACTORIES.

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BY MR. CAMERON, H.M. Inspector of Factories, Ireland.

IN weaving sheds, I regret to say, the use and, although I am aware it is a matter of argument, the abuse of steam continues; I believe that steam is frequently used in excess of any requirement simply through carelessness and lack of observation. Objection is met with the allegation of necessity. This statement constitutes difficulty for an inspector. I am convinced, however, that careful supervision would much lessen the evil.

In connection with the subject I call attention to "Neill's Patent Improved System for Moistening Air in Weaving Factories." Mr. Neill has introduced this system in the weaving sheds of the Rosebank Weaving Company. I have seen it working in one shed, and steam in another shed. The contrast was marked. The system consists in moistening the air by condensed vapour arising from a cooling reservoir. The air is collected in an enclosure over the reservoir, and from the reservoir it is introduced into the factory by fans or air propellers, and distributed, at a low temperature, through perforated wooden tubes. It is claimed by Mr. Neill that "compared with steam its advantages are obvious to those who have had experience of both systems."

A very great saving is effected by utilizing a waste product instead of steam, which has to be generated at considerable expense; and practical results show that the atmosphere produced in a weaving factory by the introduction of the vapour is favourable, not only as regards the quality and quantity of the manufacture, but as it also contributes to the health and comfort of the worker.

I wish all success to Mr. Neill's interesting experiment, for I have often felt grave concern at the condition in which I have found weaving factories through the use or the abuse of steam.

## Reviews and Notices of Books.

*Diagrams of the Mouth, Fauces, and Larynx.*

J. T. Balcomb, 23, Southampton Buildings, London. Price 1s.

THESE diagrams, consisting of coloured sketches of the various parts specified in the title, will be found useful to medical practitioners for the purpose of keeping clinical records of cases of diseases affecting the mouth, fauces, and larynx. In such an affection as

diphtheria, for instance, where the position of the diphtheritic deposition changes from day to day, it is important that the doctor should be able to record any such alterations that may take place. This could be readily effected by marking one of the diagrams and gumming it in the case-book or visiting list, with which object in view the diagrams are provided at the back with adhesive material. Of course, the same arrangement would apply, as regards tonsillitis, laryngitis, and other disorders in which it is desirable that a diurnal register of progress should be preserved.

*Influenza: Its History, Nature, and Cure.*

Pp. 26. Fourth Edition. 3d. Beaumont and Co., 39, Southampton Street, Strand, London.

THIS pamphlet, which has already passed into a third edition, contains a large amount of information concerning the pest which is now ravaging every part of the British Isles—indeed, we might say, every part of the world. This disease is now in the third successive year of its prevalence, the first appearance of the present epidemic having been in the winter of 1889-90, and each year it increases in virulence and frequency, as on former occasions of its making its home in Great Britain. The author of the pamphlet thinks, and with sound reason too, that sanitary authorities have shown great negligence in not meeting the epidemic by proper hygienic measures. This is the opinion of other persons specially able to form an opinion, as was evidenced by the expressions made use of by the speakers at a recent meeting of the Society of Medical Officers of Health. Dr. Sisley, who read a paper on "Influenza and the Laws Concerning Infectious Diseases," stated that two important questions arose, viz. —1. Is an epidemic of influenza of sufficient national importance to make it worthy of special attention? 2. Do we know enough of the mode in which influenza is spread to justify us in saying that it is infectious? As might be expected, he answered both of these ques-



tions in the affirmative. He argued that, apart from any strict enforcement of sanitary regulations, much benefit might be expected to result from people learning that the question whether they got influenza or not, must depend, in great measure, on themselves—that is to say, on whether they exposed themselves to infection or not; and he also contended that it was the duty of every sanitary authority to give the public some general advice on the subject of contagion.

There is no doubt, whatever, of the universally wide spread of influenza; in the provinces, and even in the suburban districts, this is a more fully recognised fact than in the metropolis, probably because in the country, owing to a relatively smaller population people know and talk more about the sufferers in their immediate locality.

As regards the prevention of influenza, the pamphlet before us insists mainly on general sanitary precautions, such as regular living, nourishing diet, air, light, and exercise. The treatment is dealt with on similarly broad lines. In addition to the information concerning influenza, the pamphlet contains a variety of useful hygienic hints.

*Patent alias Quack Medicines.* Pp. 128.

Beaumont & Co., 39, Southampton Street, Strand, London. Price 1s.

THIS handy little volume is a reprint, with some additional matter, of the articles upon Patent Medicines and Patent Medicine Law which have appeared in *HYGIENE* during the past year. The necessity of reform in respect of the law applying to patent medicines is proved beyond doubt. It is a scandal that the British Government, for the sake of bringing in some £200,000 to the revenue, should indirectly foster quackery, to the prejudice of the public and the medical profession. To these we may add the chemists, who are beginning to discover that by undertaking the sale of patent medicines they are doing themselves pecuniary harm, particularly when they are thus placed in a

competition with other vendors of patent medicines, including a miscellaneous lot of people wholly unfit to be entrusted with the sale of potent drugs.

This book contains a mass of information never brought together within the covers of a single volume, and it should be not only read but circulated by all medical men and qualified chemists. Speaking on this latter point, it is mentioned in the preface that an American physician of eminence has written to the publishers inquiring the price of 1,000 copies for distribution amongst his medical friends and patients in the United States, where quackery prevails even more than in this country. The circumstance that the analyses of the various nostrums dealt with in this book were conducted by Mr. A. W. Stokes, F.C.S., public analyst for Paddington and other important metropolitan districts is, of itself, a guarantee of their correctness and completeness. Amongst the patent medicines specially reported on in this readable and amusing volume, are Mattei's Electro-Homœopathic Remedies, Clarke's Blood Mixture, Revalenta Arabica, Sequah's Oil and Prairie Flower Mixture, Holloway's Pills and Ointment, Mother Seigel's Syrup, and many other widely advertised preparations.

## READING IN RAILWAY CARRIAGES.

OPHTHALMIC surgeons have long warned people not to read in railway carriages, and have pointed out that the sudden jerks with which trains advance, lead to a constant movement of the book and consequently to a great strain of the adjusting apparatus of the eyes. Some time ago I found myself in an express train on its way to a provincial city, where the Church Congress was about to be held; the carriages were full of persons hurrying thither, and there were six young clergymen in my compartment. All were intently reading, and I watched them for many miles more curiously than I had ever before watched half a dozen men reading. I soon

noticed that one only had perfect, normal vision, and he threw his head well back and supported his book firmly against his crossed knees; the book did not shake much, and his eyes were not greatly strained. But the other five, in different degrees, all had imperfect sight, one or two very bad sight indeed, and they stooped over their books, holding the latter close to their eyes. I could hardly have believed it possible that books should jerk about so much; sometimes the eyes were five inches off, at others, fourteen or sixteen, and this went on without a break. I could not but wonder how many tugs the muscles gave the eyes, and how great was the compression of the eyeballs going on. Though young, all these clergymen were, of course, full-grown and set, and their sight was not likely to be seriously affected; but what would have been the case with children of twelve or thirteen, in whom the eyeball is readily compressed and pulled out of its normal shape? The alarming increase of short sight may find one of its chief causes in reading in trains. It would be far better never to strain the eyes in this fashion, but what is only imprudent in the grown up is most foolish and perilous in the very young, and children, at any rate, should be strictly prohibited reading in trains.

#### A MEDALLIST IN SURGERY.

FOOD PRICES EIGHTY YEARS AGO were somewhat different to those of the present day. According to an old manuscript record, the prices of wheat in Shrewsbury market, on August 8th, 1812, was 27s. 11½d.; on the 15th of the same month, 28s. 3d. Price and weight of bread on August 22nd, 1812:—

|          |     |     |                    |
|----------|-----|-----|--------------------|
| 1s. loaf | ... | ... | weight, 2lb. 1¾oz. |
| 6d. "    | ... | ... | " 1lb. 1oz.        |
| 3d. "    | ... | ... | " 9¼oz.            |
| 2d. "    | ... | ... | " 5¾oz.            |

THE ANNUAL DEATH RATE of many of our large cities and towns would be fearfully high if the mortality continued at the rate recorded during the last weeks of January. For instance, London, 40 per 1,000 per annum; Portsmouth 57, Brighton 60, Wolverhampton 48, and Liverpool 42. Of course, much of this increased relative mortality is attributable to the extensive prevalence of influenza, and of various complications such as pneumonia and bronchitis.

#### IN MEMORIAM.

ALFRED CARPENTER, M.D., D.P.H.,  
J.P.

As these pages are passing through the press we learn, with deep regret, that Dr. Alfred Carpenter, J.P., whose article on the power of soil and vegetation combined to destroy disease germs appears in another part of the February number of *HYGIENE*, died on January 27th, at Ventnor, which place he had visited, in the hope of improving the state of his health. For many years Dr. Carpenter was in extensive practice at Croydon, but retired some time back, and has since devoted his whole attention to sanitary and social work. He was an indefatigable magistrate, and took great interest in municipal affairs. His contributions to sanitary literature were numerous and valuable, while upon all questions connected with sewage farming he had no equal; and we feel that a fitting tribute to his memory is the publication in our present issue of a valuable contribution from his pen upon that subject. Dr. Carpenter held various public appointments. He was an examiner in State Medicine in the University of Cambridge; lecturer on hygiene at St. Thomas's Hospital; vice-president of the British Medical Association; a member of the Royal Commission on Small-pox Hospitals; and consulting physician to several charitable and other institutions. Notwithstanding the numerous and constant demands upon his time and attention, Dr. Carpenter found sufficient leisure for political affairs, and came forward as a Liberal candidate for Parliamentary honours upon two occasions, namely, for Bristol at one election, and for the Reigate division in 1883, but was unsuccessful in both instances. As a member of the Surrey County Council, Dr. Carpenter rendered great service to the locality in which he had so long resided, and where the loss created by his death must long be keenly felt by all who knew him.



## Notes and News.

AN EASTERN STORY, *à propos* of panic during the prevalence of epidemics, runs as follows:—A man going out of a town met Death, who told him that it was fortunate that he had left when he did, as Death's mission was to destroy all the people in the place. Meeting Death some time afterwards in a different part of Persia, the man ventured to address him upon the subject. "I killed a hundred of the inhabitants," said Death. "But there were 5000 people in the town," interposed the man. "True," replied Death, "and they were all destroyed; I killed 100, and fear killed the rest."

MARGARINE.—Chemical experts in Paris have lately found themselves placed in some difficulty through the improvements which the manufacturers of margarine have effected in making that article, and the consequent increased care requisite in detecting the adulteration of butter with margarine. Fortunately, however, the official analysts at the municipal laboratory succeeded in establishing their point, and heavy fines were inflicted upon the defendants. Seeing that margarine of the best quality can be made at the cost of 5d. to 8d. per lb., while genuine butter would fetch 1s. 6d. to 1s. 9d. per lb. in Paris, it is not necessary to go far to seek an explanation of the keenness of margarine manufacturers in their efforts to produce an article that shall escape detection.

POULTRY AND GAME are imported from abroad in quantities which mere figures hardly serve to give a full conception of. During the past twelve months, there have been imported into this country 1,200,000 fowls, 500,000 ptarmigan, 200,000 black game, 10,000 partridges, and 1,000,000 wild ducks. The greater part of this enormous feathered import is derived from Russia and other countries in Northern Europe—the cold which prevails during many months facilitating their keeping longer than in milder climates.

CERTAIN, BUT NOT SURE.—The *Evening News and Post* says that there is in the neighbourhood of Greenwich a chemist who boldly advertises that he sells "a certain preventive against influenza," but, unfortunately for the realisation of his boast, the chemist has himself been one of the worst sufferers. Perhaps, however, he has not tried his own remedy.

INSPECTION OF INSANITARY DWELLINGS.—The Sanitary Committee of the Town Council of Newcastle-on-Tyne have issued a notice stating that the staff of the Health Department are prepared to inspect, free of charge, any occupied house within its district on complaint of nuisance or offensive smell, communicated either verbally or by post to the department, by the owner or occupier.

THE PREVENTION OF CONSUMPTION.—It is more generally recognised on the Continent than in this country, that phthisis is often contagious. In consequence of the alarming extent to which consumption

has lately prevailed in Harre, the municipal council have issued certain regulations for diminishing its spread. Whenever information is received of a death from this disorder, a health inspector calls on the family of the deceased to arrange for the fumigation of the sick-room in which the patient died, and for the disinfection in the hot-air chamber provided by the authorities, of bedding, clothing, and carpets. In addition, hygienic precautions are recommended to be observed in houses where consumptive patients reside, such as the provision of spittoons to receive the patient's expectoration, and the use of indiarubber pouches (which can be readily cleansed by frequent scalding) instead of pockets in garments, for holding handkerchiefs. An excellent paper on the head of special measures for the prevention of consumption, written by Dr. Ransome, F.R.S., Physician to the Manchester Hospital for Consumption, appeared in the November issue of *HYGIENE*.

### ON PATENT MEDICINE STORIES.

It was only a newspaper story,  
And yet, as I read it o'er,  
My eyes grew moist and heavy  
As they had not in years before.  
It was not the art of the writer  
That on my heart-strings swept,  
But the story simple and tender,  
Went to my heart as I wept.  
But when I arrived at the "finis,"  
It caused my heart to ache;  
And I spoke strong words, for that tender tale  
Was a patent medicine "fake."

*Tit-Bits.*

BREACHES OF THE FACTORY ACT.—At the Braintree Petty Sessions, James Fuller, boot manufacturer, of the Eastern Counties Steam Boot Works, was fined £10 14s., including costs, for having employed twelve young persons for more than five hours without an interval, and for employing four others for more than seven days without having a medical certificate of their fitness for such employment. In extenuation of the first offence it was pleaded that there had been a strike at the factory, and that the defendant in order to humour the men fell in with their desires in regard to the hours of labour.

Fogs.—The trite proverb, "Nothing new under the sun," is verified by the following extract from the poems of Dowland, a writer who flourished in the Elizabethan period—certainly a forcible description of such weather as has been lately experienced in many parts of the British Isles:—

"Mourn, mourn, day is with darkness fled!  
What heaven then governs earth?  
Oh, none; but hell in heaven's stead  
Chokes with his mists our mirth.  
Mourn, mourn! look now for no more day,  
Nor night but that from hell;  
Then all must, as they may,  
In darkness learn to dwell."

**WARMING RAILWAY CARRIAGES** during cold weather has been the subject of a commission of inquiry appointed by the directors of French railways. Both in England and in Germany the method of using hot water foot-warmers was found to be the only one in vogue. On the North of France Railway a new method is being tried on a large scale by the agency of boxes containing acetate of soda. This chemical is put in a solid form into the boxes, which are then plunged into hot water. The acetate of soda becomes liquefied by this means. Next the boxes are taken out of the water, wiped dry, and placed in the carriages. The soda-salt commences to resume the solid condition, and during that process, which occupies from five to six hours, it gradually gives off the heat which it had absorbed during the operation of melting.

**FIRES IN THE METROPOLIS.**—It is somewhat alarming to learn that the number of fires in London increases in a faster ratio than the number of houses. During the past year 2,892 fires occurred, of which 193 were specially serious, and involved risk to human life. Thirty persons were actually destroyed by burning or suffocation, while 31 others of those who were rescued from the flames were so much injured as to succumb subsequently in hospital or elsewhere. The total number of fires within the metropolitan area during the year exceeded by 337 that of the previous twelvemonths, and was 691 above the average of the past ten years. The table of the causes of the fires, which accompanies the report of the chief officer of the fire brigade, is instructive. No less than 309 London fires were attributed to the explosion or upsetting of spirit lamps, several of these resulting in the death, or serious mutilation by burns, of persons in the room at the time of the accident happening. Amongst other causes are reported the following:—Throwing down lights, 276; escape of gas, 69; airing linen, 59; children playing with fire, 39; fireworks, 10. Some idea of the magnitude of the operations of the London Fire Brigade may be gathered from the fact that the distance travelled by the fire engines during the year is estimated at 65,800 miles, while the quantity of water used in the extinction of the fires was nineteen millions of gallons, or eighty-four thousand tons.

**A CURIOUS ADDITION TO THE PHARMACOPŒIA** was made some time ago. A London Physician, writing to a lady patient, said "I do not feel justified in taking your money any longer, as I can do you no good. The only remedy for your disease is *Edax rerum*." The doctor referred to the proverb, "*Tempus edax rerum*," and intended thus learnedly to point out that time alone could determine the lady's illness. But, the lady concluding in her own mind that *Edax rerum* was the name of a medicine, went to a chemist's in the town where she had gone to reside, and asked for some of it to be prepared. The chemist's assistant, taking advantage of the lady's ignorance, made up a

bottle of medicine, for which he charged her 7s. 6d. This was continued for a long period, and whether through the power of faith, aided by hope, or because the disease wore itself out, the lady eventually recovered. Coming up to London, during the Jubilee celebrations, the lady met her old doctor, and warmly thanked him for his kindness and skill in prescribing *Edax rerum*. Thus the fraud came to light; and the lady, enraged at having been thus duped; vented her anger by bringing an unsuccessful action against the unlucky chemist, whose assistant had previously made himself scarce, with the lady's cash in his pocket, for it appears that he kept the affair, as well as the proceeds, to himself till *Tempus* proved too much for him, and brought about his detection.

**THE LONDON WATER SUPPLY QUESTION.**—At a recent meeting of the London County Council the following letter from the President of the Local Government Board was read:—

"Sir,—Referring to the correspondence which has taken place between the London County Council and her Majesty's Government, I have to intimate to you, for the information of the Council, that her Majesty's Government have resolved to advise the appointment of a Royal Commission to inquire 'whether, taking into consideration the growth of the population of the metropolis and the districts within the limits of the metropolitan water companies, and also the needs of the localities not supplied by any metropolitan company, but within the watersheds of the Thames and the Lea, the present sources of supply of these companies are adequate in quantity and quality; and, if inadequate, whether such supply as may be required can be obtained within the watersheds referred to, having due regard to the claims of the districts outside the metropolis but within these watersheds, or will have to be obtained outside the watersheds of the Thames and the Lea.' I am, Sir, your obedient servant,

"(Signed) CHARLES T. RITCHIE."

We cannot share in the satisfaction of some of our contemporaries at this announcement, which we regard as evidence that nothing practical will be done during the present Parliament. Royal Commissions involve a good deal of expense, often to little purpose; but, then, they also take up a good deal of time, thus enabling a government to shelve any important question, on which it may not desire to take definite action. Further, the delay thus created tends to divest public attention and gives the water companies an opportunity to strengthen their position, and to raise their already exorbitant demands for compensation when—as must be sooner or later—their monopoly is taken over, and managed by public bodies for the public benefit.

**ST. JOHN'S AMBULANCE ASSOCIATION.**—The presentation of prizes to the successful students in the No. 2 Metropolitan District took place at the People's Palace Mile End Road. Sir A. K. Rolit, M.P., presided, supported by a number of gentlemen interested in the



Association. From the report presented to the meeting, it appeared that the total number of persons attending the lectures during the past session was 1,892, out of whom 1,130 succeeded in obtaining certificates, while 140 women earned nursing certificates. The chairman stated that the ambulance movement was one of the most gratifying that had taken place in modern times. Its history, notwithstanding its present prominent position, extended over scarcely half a century. The credit of initiating the work of giving aid to the wounded might be traced to the French, who instituted something in the shape of ambulance arrangements during the revolutionary struggles, in the time of the third Napoleon. It was not until our last great war, the Crimean campaign, that the English people recognised how important the work was, for it was then shown that of 20,000 men lost on our side, only 2,000 died on the battlefield. Many thousands of lives would undoubtedly have been saved during that war if the ambulance arrangements had been in the condition they are now in.

COFFEE-TEA was brought under the notice of the Royal Botanic Society of London at a meeting presided over by Mr. G. J. Symons, F.R.S. The samples of coffee-tea, or prepared coffee-leavés, were grown in the Society's Conservatory. The Secretary said it had been estimated that the percentage of theine in the leaves of coffee was 1.26 as against 1.00 in the beans. As the leaves may be easily grown in many parts of the world where it is difficult to ensure good crops of coffee beans, he thought it might prove a valuable agricultural product in many of our warmer colonies. At present, he said, only some two millions of men use coffee tea in comparison with one hundred and ten millions who use the bean, and five hundred millions who drink Chinese and Indian tea.

THE PROTECTION OF CHILDREN.—The National Society for the Prevention of Cruelty to Children during the last quarter investigated 2,181 complaints of cruelty (involving the welfare of 5,128 children), thus classified: General ill-treatment, 426; assaults, 103; neglect and starvation, 1,252; abandonment and exposure, 120; begging cases, 113; immorality, 96; and other wrongs, 71. In 1,174 cases warnings were given to offenders; 306 cases were of so serious a nature as to necessitate prosecutions (convicted 284, discharged 22), which resulted in the infliction of 39 years' imprisonment and £71 in fines.

NOVEL ADULTERATION OF SUGAR.—Out of 246 samples recently examined, nearly one-seventh were reported as having been coloured with an aniline dye of an amber tint in order to make white crystals of

beet sugar imitate the more valuable Demerara. The quantity of the dye used, however, is very minute.

THE DEAD SEA loses every day by evaporation no less than six and a half million tons of water—an enormous mass, but one which is easily drawn up by the rays of a fiery sun—the valley wherein the sea, which is of about the size of the Lake of Geneva, is situated being one of the hottest points upon the globe. The vast basin in which it lies is also remarkable as the deepest depression upon the surface of the earth, being more than 1,300 ft. below the level of the Mediterranean. Rocky walls, rising to 2,600 ft. in height, surround it on all sides. It is nourished only by the River Jordan, whose constant tribute of waters must be absorbed by evaporation only, there being no outlet at any point.

THE BURIAL OF STILL-BORN CHILDREN in the same coffins with other bodies is likely to open the way to various illegal practices, and we are glad to learn that the medical officer of health for Kensington, Dr. Dudfield, has suggested to the Secretary of State and the London County Council the desirability of legislation to secure the registration and proper burial of still-born children.

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## SPECIAL NOTICES.

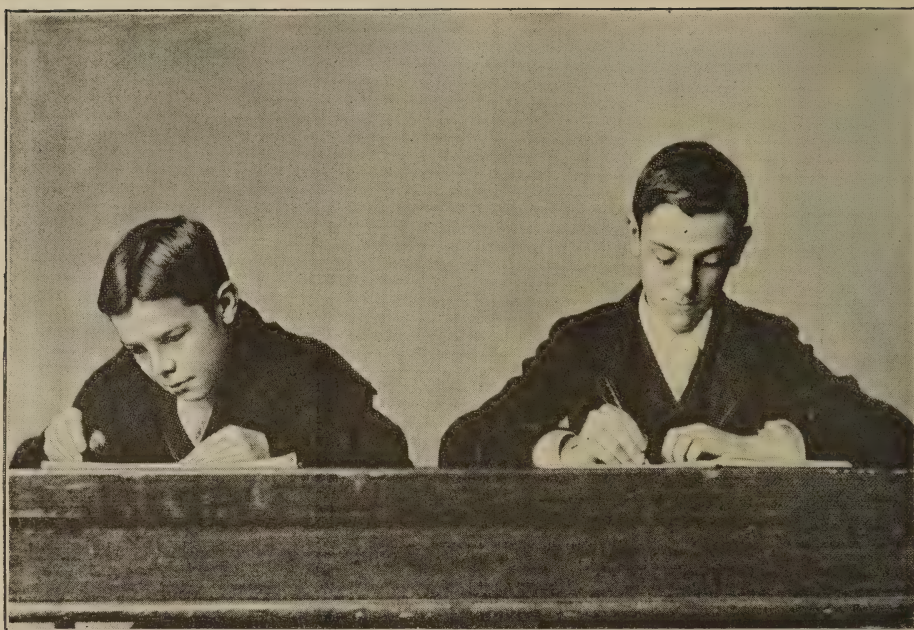
EDITORIAL.—The Editor will be pleased, at any time, to receive communications, books for review, etc., bearing upon the numerous important subjects dealt with in these columns.

PUBLISHER'S NOTICE.—The Annual Subscription is reduced to 6s., for which *HYGIENE* will be forwarded, *post free*, for 1892, to any address in Great Britain and Ireland, Australia, New Zealand, Canada, the United States, Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Russia, Portugal, Spain, Sweden, Switzerland, Turkey, and other countries included in the Postal Union.

HYGIENE FOR 1891.—This volume (Vol. IV.) with title-page and index is now ready, and will be sent to any address on receipt of post-office order for 6s.

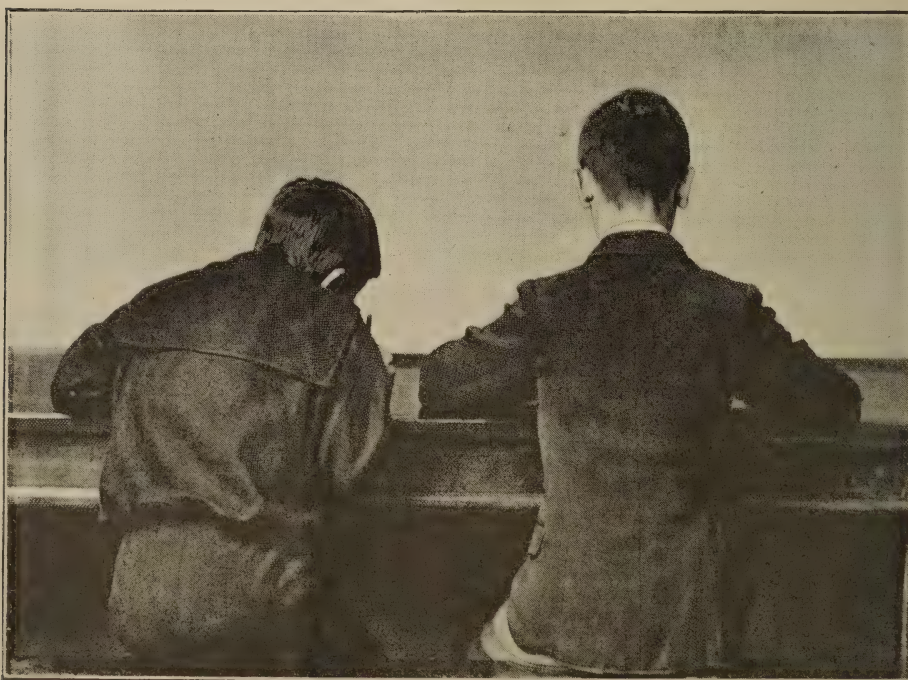






POSITION IN SLOPING WRITING.  
(Front View.)

POSITION IN VERTICAL WRITING.  
(Front View.)



TWISTED POSITION REQUIRED AND TAUGHT  
IN SLOPING WRITING  
(Back View.)

NATURAL POSITION REQUIRED AND TAUGHT  
IN VERTICAL WRITING.  
(Back View.)

# HANDWRITING IN RELATION TO HYGIENE.

(HYGIENE for March, 1892. Page 65.)

# HYGIENE,

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## HANDWRITING IN RELATION TO HYGIENE.

By JOHN JACKSON, F.E.I.S.

I THINK it was Lord Palmerston who once remarked that "Writing is almost as important as speaking, because every man, whatever his station in life may be, must have constant occasion to convey his thoughts, his wishes, his complaints, his desires in writing; and unless that writing be legible and easily read, with the letters well formed so that a person can read that writing without trouble and delay, it fails by disgusting the person to whom it is addressed." It does not, however, require the authority of a renowned and eloquent statesman to inform or to assure us of the ever increasing employment and importance of the caligraphic art. There is no occupation or rank in life into which as a potent factor, as an energising influence, writing does not enter. Whether in the diary and correspondence of the private individual, the recording of the business transactions of the merchant, the literature of the author and scientist, the briefs of the barrister, or the manuscripts of the theologian and ecclesiastic, writing is alike everywhere paramount and universally potential.

But not only is it thus all pervasive in everyday life throughout the civilized world, it rises to even greater prominence and significance in the case of the hundreds of thousands who as

secretaries, copyists, or clerks, follow writing as their profession or business, and derive from it their sole means of subsistence. Such individuals are employed the year round for from eight to sixteen hours daily exclusively in clerical work. It is indeed impossible to exaggerate the importance of an art which is pre-eminently the vital principle in the machinery of the Law, the Civil Service, Commerce, Science, and individual as well as international communication.

If we inquire into the origin and development of handwriting, we find it had its birth in an age of semi-barbarism; that at first it consisted of the most inadequate because the most imperfect pictorial representations, which were gradually merged into a very crude hieroglyphic as the basis of an incipient alphabet. Subsequently this was modified still further, until ultimately it developed into an equally crude phonetic, the characters in which had little, if any, scientific meaning or relationship. From the ornate and laboured style of the mediæval period our present Italian style has been evolved, and if we carefully trace this development through its manifold stages and variations, we shall discover that it and they have all been purely responsive to exclusively caligraphic or so-called artistic demands. Pursuing our investigation a step further, the fact is revealed that these caligraphic and artistic demands have been controlled and dictated, not by logical and scientific principles, but by capricious and often conflicting theories.



The writing and not the writer has invariably been the supreme consideration in the growth and perfecting of the art of penmanship. Such and such a style of writing was pronounced to be essential (the correct thing, in short), the dictum was accepted, the idea of an appeal was never entertained, and our victimised ancestry were doomed to bow, cringe, and twist under the system of bondage thus established. As to hygienic principles, these have never been associated, even in a remote degree, with the history of slanting writing, which up to quite recent years has reigned unrivalled and undisturbed in our midst.

Indeed, physiological requirements have not been recognised, much less urged—at any rate, not in England—until within the past few years; and even at the present day not one teacher in fifty would spontaneously admit any possible connection between hygiene and handwriting, so defective is the state of education in this matter. That these hygienic principles and physiological requirements are, or should be, an integral part of any system of penmanship that is accepted by the nation, there cannot be the shadow of a doubt; but we may repeat emphatically, that the existing style of oblique or slant writing has been evolved and elaborated independent and in spite of every hygienic and physiological principle. It is not the less remarkable that when the subject of school postures first engaged the attention of the medical faculty the real root of the malady was never for one moment suspected, and that for so long a time it remained undiscovered. Possibly this was after all not unnatural, as the conception of an imperfection in the writing itself would be the last to strike the mind of the inquirer. Hence, the various and contradictory conclusions that have been made. First, we were informed the instruction was at fault. Teachers were indifferent, or not sufficiently careful to inculcate correct postures, it only needed strict attention, efficient supervision, and constant care to remedy the evil.

Time and experience, however, proved the contrary, and then came the crusade against desks and seats. The former were too sloping, or not sloping enough, the latter were too high or too low, and they were not adjustable, so we got both sliding seats and sliding desks; but, unfortunately, the malady remained, although the old desks had gone. The question of light next exercised the scrutiny of our experts, and bad light, or unsuitable light, was made the scapegoat. This theory was almost immediately exploded, and the question being still unsolved remained in abeyance for a brief space.

It is matter for sincere congratulation that subsequent research has proved more successful that all external and subordinate points have been finally disposed of, and that the “system of writing—of sloping writing”—is the sole subject of investigation. And we are highly gratified to learn that the consensus of opinion finds its expression in the almost unanimous declaration that the “slant” or “slope” of the writing is the undoubted cause of the unhealthy and abnormal postures so grievously complained of. For thirty years we have had abundant opportunity of observation and experiment, and we have no hesitation in giving an emphatic confirmation to the medical testimony just alluded to. No matter what pattern desks and seats are in use, or what the light may be, or what the nature of the instructions, whenever the children are required to write in the sloping style their postures will present every possible variety of distortion and abnormality.

I am glad to be able to quote from an article in the weekly Austrian *Hygiene*, edited by Dr. J. Daimer, Secretary of the Supreme Council of Health in Vienna, a reprint of which was kindly sent me by Professor A. Reuss, and translated by my friend, Dr. S. W. Carruthers.

“The question of school-benches was considered as solved by a correct proportioning to the size of the body, by the introduction of the minimum distance, and the application of so-

called back-seats. The question proved unsolved. Children sat upon the new benches, approved by the faculty, just as badly as upon the old."

The concurrent evidence of a combination of medical experts and specialists, from which there can be no appeal, warrants the assertion that the side position of the body is inevitable in sloping writing; that twisting of the neck is equally unavoidable; that distortion of the spine must accompany the side position; that displacement of the right shoulder is a necessary consequence of the arm being pressed close in to the side; that the wrist must be deflected from the natural direction in order to maintain the required slope of the pen; that the side position of the body involves a disturbance of the common action of the two eyes, and that the oblique view thus obtained is more or less delusive; and that sprawling on or over the desks causing pressure on the chest is induced, if not also required, by the general posture imposed by the slanting writing. We will epitomise the directions given in our own young days, and still prevalent amongst the present generation of teachers, to a writing class.

1. Turn your left sides to the Desks.\*
2. Press the left arm close in to the side.
3. Place your left hand on the copy-book.
4. Press your right elbow in to the side.
5. Point your pen towards your right ear.
6. Turn your face towards the book.
7. Grasp the pen firmly, and go on writing.

One involuntarily exclaims, What can be expected from a mode of writing that inflicts such conditions, such contortions as these? The reply is, From the writing our expectations end in disappointment and acknowledged failure, since not twenty out of a hundred specimens of penmanship promiscuously taken are fit to be classed as excellent; and from the ranks of the writers we obtain a vast number of debilitated and deformed victims so seriously

afflicted in heart, lungs, spine, or eyes, as to create a feeling of apprehension and alarm in medical and educational circles, yea, even in councils and cabinets. Eminent medical gentlemen have pursued their investigations into the question of postures with praiseworthy ability and exemplary patience. Whilst teachers have been, as a class, wholly quiescent, such men as Barnard, Cohn, Coindet, Carpenter, Carter, Guillaume, Leibreich, Von Reuss, Lorenz, Smith, and a host of others, have been indefatigably working, with the outcome of an unanimous pronouncement that all the ills which initiated the inquiry are traced to the postures assumed in and required by the "slanting writing" taught in our schools. One writer tells us that "the postures of young people assumed in the sloping writing are one of the chief factors in the production of spinal curvature." A second authority declares these postures to be, "without doubt, recognisable as one of the most frequent causes of crooked growth."

Were this the only effect it would be more than sufficient to justify a thorough investigation into the whole question; but when equally dismal testimony is borne to the injury of other organs, and the interference with other functions, the urgency of the case becomes vital and irresistible. I am not acquainted with any work that so fully exhausts this part of our question as the Reports of Drs. Reuss and Lorenz already alluded to.

The great specific for these abnormal postures with their train of disastrous consequences, is "vertical writing." The material difference between this upright or perpendicular style and slanting writing is in the direction of the down strokes of the letters: in the former being definitely and absolutely upright, in the latter indefinitely and variously sloped or oblique. The difference which this slight and seemingly insignificant alteration in the down strokes makes, the effect which it exerts upon the writer, is incredible, and when in conjunction with

\* See frontispiece for comparison of postures demanded by both styles of writing severally.



the minor characteristics of the system, viz., shorter loops, minimum thickness and continuity, the results are almost magical. Before detailing the several hygienic merits of upright penmanship, I would make grateful reference to some of the professional statements given in favour of vertical writing. I say grateful reference, for to a teacher who has written the style and advocated its manifold claims to superiority for so many years, who has been met with derision and indifference, with incredulity and opposition, from almost overwhelming columns of prejudiced "slopers"—it is more than solacing to receive the repeated, the unanimous, and the independent support of a phalanx of medical professors as invincible as it is incontestible. These experts (and in their own department they constitute our only qualified judges) declare that "vertical writing is the only system consistent with all hygienic principles," that "it is impossible for writers to avoid twisting the spine unless they adopt an upright style of caligraphy," that "the absolute superiority of this method of writing over other methods must be recognized," and that "upright writing is very much to be preferred to oblique writing."

Now, what are the postures, or what is the position, prescribed in the vertical writing? In one word, it is the natural position, the most normal position possible; indeed, it is the posture that a pupil will instinctively assume, the attitude that he will naturally adopt, in the effort to write vertically. Granted that the book lies evenly on the desk, and that the scholar has been duly instructed how to hold his pen between the thumb and two forefingers, the writer's position is dictated by the style of writing adopted, and he sits evenly and straight before his desk, with both arms thrown freely thereon, the whole posture being the simplest and easiest that could be prescribed for the efficient performance of the work to be done. The eye looks straight down upon his task, the hand, wrist,

and arm are in the best posture for a running handwriting, the body is not distressed by artificial posing, the spine rests in a perfectly normal condition, the chest remains unrestrained by any undue leaning forward, and the writing is produced under the most favourable hygienic conditions with the least expenditure of energy, and, therefore, with the minimum amount of weariness (see frontispiece.)

Instead of the oblique position, we have the square or front posture; instead of the head all awry, we have a straight pose, securing an identity or parallelism of the facial and chest planes; instead of the elbows close in to the side, we have them both unrestricted and free; in place of the oblique and consequently delusive view of the book, we secure an even and perfect command of the writing; and instead of the awkward sprawl over the desk, we have the nearly upright position, free from even the tendency towards an unhealthy or painful attitude. It may be safely predicated that since all unnatural positions are precluded from the system, and that only the most natural and easy posture are demanded by it, vertical writing in this relation may be accepted as strictly fulfilling every hygienic requirement.

Moreover, from an educational point of view, vertical writing asserts its hygienic superiority, if we contemplate its simplicity and the resulting diminution of labour in teaching and acquiring the art. This economy I have frequently demonstrated as amounting to from 30 to 50 per cent. Also, when we take into account the advantages it offers us in legibility and speed (in both of which respects it is far ahead of sloping writing), thus securing an immense saving of time and energy in its production and perusal, we are driven to the conclusion that upright penmanship is the true penmanship, the *Ultima Thule* of caligraphic ambition giving us the maximum of hygienic merits with no detracting disadvantages.

A word as to the actual achievements of vertical writing recorded in the evidence of

numerous teachers in all grades of schools where it has superseded the old Italian style. And, let it be remembered, this test of experience is the crucial test which will once for all, and which has once for all, determined the correctness and soundness of theoretical medical experiments and deductions, and of our own educational categorical statements.

We are enabled to say the evidence is uniform and undisturbed by a single conflicting dissentient. Scores and hundreds of contributions of this kind have been received, yielding a magnificent variety of testimony bearing on every possible question in the controversy. Briefly summarised, the evidence goes to show that wherever the vertical writing has been introduced, it—(a) enkindles a greater interest in the art, both with teachers and children; (b), it entails much less labour in teaching; (c), it wonderfully accelerates the rate of progress and improvement; (d), it attains to a much higher standard of excellence, and develops a much greater demand over the pen; (e), it materially increases the speed of writing; and (f), lastly, it disposes finally and satisfactorily of the awkward and painful postures that have, under the régime of sloping writing, created such havoc in, and worked such irreparable mischief to, the juvenile constituency for so many years. Encouraged by these unquestionable facts, by the harmony and concurrence of both medical and educational evidence, and the more than commensurate results which have attended its introduction and adoption, one can surely be justified in believing that the day is not far distant when upright penmanship shall have the pre-eminence, and when (the relation and inseparable connection of hygiene and vertical writing being universally recognised) it shall not need the protest of a faculty or the dictum of a council to make our people a nation of vertical writers, but all shall write vertically in every department of our great empire.

[The foregoing article contains the substance

of a paper read by Mr. John Jackson before the International Congress of Hygiene. After it had been read, the following resolution, moved by Dr. Kotelmann and seconded by Dr. Gladstone, Vice-Chairman of the London School Board, was put to the meeting and carried:—

“That as the hygienic advantages of vertical writing have been clearly demonstrated and established, both by medical investigation and practical experiment, and that as by its adoption the injurious postures, so productive of spinal curvature and short sight, are to a very great extent avoided, it is hereby recommended that upright penmanship be introduced and generally taught in our elementary and secondary schools.”—Ed. HYGIENE.]

### THE COLD BATH AND ITS DANGER.

By Dr. T. WAKE SMART, formerly Physician to the Salisbury Infirmary.

It is an obvious fact that there are remedies and modes of treatment at one time of the greatest possible benefit, and at another productive of dangerous, if not fatal, consequences; the difference not so much owing to the remedies as to the conditions under which they are administered. This remark applies with much force to the habit of using the cold bath, and I am induced to notice the fact from feeling very strongly on the subject, owing to the occurrence of a fatal result in three cases, and all of them attended by very similar circumstances and occurring about the same time. In all, the facts were the same, as follows:—Each of these gentlemen had risen from his bed to immerse himself immediately in his bath of cold water, as had been probably the daily habit, and hitherto with impunity; but now what occurred? Downstairs the breakfast was waiting for his arrival; he did not come. Alarm was felt, and relatives or friends hurried upstairs; no answer was given; the door of the bath-room was forced open, when the appalling sight presented itself of the



gentleman lying on the floor (having evidently recently left the bath) in an unconscious state, and either dying or already dead from fatal syncope. These three were men in the prime of life, accustomed to take active exercise, apparently in health, but known, alas! to have weakness of the heart and circulation, disregarded probably by themselves, though not by their medical advisers, and we see the result.

Three such cases, happening nearly at the same date and under such similar circumstances, naturally appeal very forcibly to one's mind, and induce the inquiry as to whether the use of the cold bath may not in many cases have a very dangerous tendency. There must always be a very strong shock to the system by rising from bed with a temperature of about 95°, and plunging immediately into a bath of cold water with a temperature perhaps but little above the freezing point; the effect of this sudden shock, or check, on the system must be to drive the blood from the skin to the internal organs, to oppress the circulation, to force the venous blood back on the heart, which, if weakened by structural changes, becomes suddenly overpowered and unable to overcome the increased pressure on its mechanism, and so a fatal termination rapidly ensues.

There can be no doubt that a strong and healthy man may take this plunge, not only with impunity, but even feel all the better for it; yet there are many apparently as strong and healthy as he, who, in reality, have an organic weakness of the heart, which to them is a source of the greatest danger. The man in health leaves his bath feeling light and refreshed, with a glow on his skin, and in this state he descends to join the breakfast party below in buoyant health and spirits, and ready for any active exercise or duty he may be called on to engage in. Another man not in health, but only apparently so, leaves his bed-room pale, chilly, and shivering; has but little appetite for his breakfast, and perhaps may require some kind of stimulant to put his circulation into

regular action. In the former case the cold bath has proved an excellent and invigorating stimulus, in the latter its effects are the very reverse; it proves itself a powerful depressant, and, if persevered in, will assuredly lead to mischief, if not death itself.

At the present day, when athletic exercises of all kinds are so much the fashion, I fear the foundation is often laid, unconsciously, no doubt, of small beginnings of organic mischief, chiefly of the central organ of the circulation, which, as life advances, lead to more pronounced and serious derangements of the health. It is of the utmost importance that young men should have the danger set before them in order when growing older to seek the advice of a physician for the purpose of ascertaining the fact whether or no the heart is in its normal condition; if not, greatest caution should be taken in avoiding every possible source of danger, one of which is, I am firmly convinced, the use of the cold bath in the manner I have indicated. Let every man who has reached the age of 35 years, consult some competent authority and be guided by the excellent advice he will be sure to receive.

As an old and retired medical man, I have no personal interest to serve in bringing forward this matter, but being deeply impressed by its importance, a sense of responsibility urges me on to raise a warning, though it be but a feeble voice, against the injudicious observance of a salutary hygienic practice, which may, as I have shown, become the cause of most dangerous and fatal effects.

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INFLUENZA.—All who have escaped this malady, at any rate in its severest form, should be thankful when they read the following graphic description of it, written by a gentleman who had a severe attack of it:—"Five weeks' blank effacement, with a brain incapable to dictate an idea, with constant pain—brow-ague, &c.—and the knowledge that your work is going hopelessly wrong, is bad enough, but the depression is over-mastering. There is no light, warmth, hope, or comfort in the world. I could not wish it to my 'dearest foe.'"

## DEFECTIVE PERSONAL HYGIENE AS IT AFFECTS THE TEETH, IN INFANCY, CHILDHOOD, AND SCHOOL LIFE.

By GEORGE CUNNINGHAM, M.A. (Cantab.),  
D.M.D. (Harvard), L.D.S., England.

It would be impossible to exaggerate the value of a good set of teeth in a healthy mouth, and that, whether the denture is regarded as an important organ of digestion, as a valuable factor in the mechanism of speech, or as a decorative appendage which adds to the beauty or attractiveness of its owner's appearance. Yet there is, probably, no portion of the physical economy which is so generally and systematically neglected. It is not surprising, therefore, that the digestion, the speech, and the appearance of the bulk of the community are most seriously affected by this general carelessness, which is only equalled by the ignorance from which it arises.

Caries is the scientific name of the disease which results in the wholesale disintegration of the tissues of the teeth, which are the hardest structures entering into man's composition. Its injurious effects are enormously increased by the fact, that, if neglected, caries almost inevitably leads to a train of diseases which have a most serious influence upon the well-being of the entire organism.

There can be no doubt that defective personal hygiene is a practical cause of this disease, which is by far the most continuously prevalent of all the diseases occurring during childhood and school life, and, one might almost add, during infancy. Professional opinion throughout the country has long been unanimous as to the prevalence of dental diseases amongst children.

A communication, read to the British Dental Association in 1885, advocating compulsory attention to the teeth of school children, originated a movement which has gone on with increasing force and influence ever since. The practical outcome of this movement was the

appointment of a committee to arrange a uniform scheme of investigation as to the condition of the teeth of school children throughout the country in order to obtain statistics for the following purposes: firstly, to acquire a more exact knowledge of the condition of children's teeth at various ages, and, secondly, to show by means of the facts thus acquired, the disabilities under which children frequently suffer in their growth and development, and the important bearing this condition has upon the future health of the individual.

This investigation is still far from being complete, but a sufficient number of examinations of a reliable nature have been made to prove the almost appalling frequency of dental caries and other diseases of the mouth, especially during the period of school life.

The frequency of caries is due to a variety of conditions which may be assigned to two distinct categories, the one intrinsic and the other extrinsic. Intrinsic conditions are those which arise from incomplete development, deficient nutrition, or the mal-position of individual, or of several teeth, all of which, by lowering their co-efficient of resistance, offer special points of attack. They, must, therefore, be regarded as predisposing conditions in contradistinction to all extrinsic agencies.

Faulty structure of the teeth is the most important of all the predisposing causes of dental caries. Just as a lump of table salt dissolves more rapidly in water, on account of its porosity, than an equal large piece of rock salt, porous dentine is more rapidly decalcified than well developed, resistant dentine, because acid can more rapidly penetrate the tissue, and less acid is required to complete the decalcification.

Deep fissures are usually found on the grinding surface of the bicuspid and molar teeth, frequently on the lingual surfaces of the front teeth and more rarely on other surfaces. These naturally favour a continual retention of food particles, and thus induce caries, from the



absence of an intact covering of enamel. If the enamel itself is also poorly developed then the advance of disease will be all the more rapid. Not unfrequently, owing to some inflammation while the tooth is being formed, the enamel, instead of being evenly distributed over the dentine, presents a pitted or deeply furrowed surface. These teeth, besides being, as a rule, weak, are extremely unsightly, and are commonly known as honeycombed teeth. Occasionally these teeth have a high co-efficient of resistance, in which case they are strong but extremely ugly. Such teeth are sometimes termed "mercurial teeth," because many competent authorities ascribe this condition to the administration of mercury, usually in the form of "teething powders." By suspending nutrition or rendering it temporarily imperfect, various diseases of infancy may cause these imperfections of enamel, which can in no way be regarded as the result of a specific form of disease; whatever the cause, the injury is effected usually during the first months of life, when it takes very little to disturb the highly susceptible functional harmony of nutrition, growth, and development.

A crowded condition or an irregular position of the teeth in the jaws predisposes to decay by forming spaces which favour the accumulation and retention of fermenting and acid-forming substances in contact with the enamel; in this connection the form of the teeth is not without considerable influence, as teeth with convex contiguous surfaces, by having their points of attack reduced to a minimum, are relatively less subject to caries than teeth with flat or slightly concave surfaces. Many of these irregularities are entirely due to preventable causes, two of which are especially important as affecting that period of life to which the consideration of the subject is at present necessarily limited. Premature loss of temporary teeth is probably the cause of some irregularities, but their undue retention causes a much greater number with even more disastrous effects. The roots of the deciduous teeth are not always completely re-

moved by the natural process, and the successional tooth is thereby frequently diverted from assuming its natural position in the arch. More serious effects, however, are produced by the retention of temporary teeth, usually in a carious condition, and frequently accompanied by a chronic abscess formation, which originated in neglected caries. Undue retention of the temporary teeth must be regarded as a predisposing cause of caries, if only from the fact that it favours the retention of fermentable matter, thus preventing the teeth being kept clean either spontaneously by the tongue, or in mastication, or artificially by the application of the tooth-brush. A large number of these teeth, during the eruptive period, are found to be in such a condition that the rough sharp necrosed roots protrude, and often pierce the cheek, thus accounting for the cicatricial attachments occasionally binding the cheek to the gum.

A recession or loosening of the gums from neglect of the teeth not only lays bare the part of the tooth which is unprotected by enamel but also permits the entrance of food particles round the necks of the teeth or into pockets formed by the loosening of the gums, by which means a further predisposing cause for caries is furnished. This condition is more characteristic of a later period of life than that with which we are presently concerned, but the results of the examinations of the teeth of school children prove that, although this condition is relatively infrequent, it is occasionally found at this early life, when it is usually accompanied by deposits of tartar, which may be of very considerable quantity. Such a condition is entirely due to defective personal hygiene of the mouth. Many of the teeth of the school children examined show that they were in many instances remarkably clean, although they were absolutely innocent of the application of the tooth-brush, which conclusively proves that mastication properly performed and aided by the movement of the lips and tongue is highly influential in keeping

the teeth clean, and the mouth in a healthy condition.

Many believe that a predisposition to caries may be inherited. It cannot be denied that badly-developed, irregular teeth are inherited, and in so far hereditariness may be considered as a predisposing cause of caries.

With regard to general diseases which are generally described as predisposing causes, we adopt Miller's view that they should rather be regarded as "exciting causes of caries by imparting an acid reaction to the buccal juices."

Many authorities, notably Galippe and Magitot, in France, and Harlan, Sitherwood, and Kingsley, in America, regard excessive intellectual work during childhood and adolescence as an important factor in promoting the frequency of caries. Galippe has pointed out that while we make laws in order to prevent children working in factories at an early age, little or no heed is paid to those other factories usually known as "schools," in which pupils submit spontaneously to, or are coerced into, intense mental work, with a view to some examination which crowns their studies or decides their future career. There is, on the whole, good ground for believing, as these authorities maintain, that premature or excessive intellectual work reacts upon the constitution of the teeth, and that in pupils whose scholastic success is very remarkable, caries is extremely frequent.

The extrinsic agencies producing caries include the result of such general diseases as scrofula, rickets, dyspepsia, fever, and others such as rheumatism, gout, etc., not usually associated with the period of school life. Any disease (local or general) which has the effect of acidifying the saliva should be regarded as an exciting cause of caries, and therefore demanding special attention to the mouth, with a view to the neutralisation of the saliva. Increased attention should, therefore, be devoted to the hygienic care of the mouth during sickness, instead of which even ordinary precautions are

relaxed. Even when the patient is incapable of using a tooth-brush, his comfort will be increased by having the mouth rinsed by an antiseptic wash.

The chief exciting cause is the chemical change produced by micro-organisms in the fermentable matter lodged upon and between the teeth. Caries is, therefore, "a chemico-parasitical process consisting of two distinctly marked stages; first, decalcification, or softening of the tissue, and, secondly, dissolution of the softened residue." The acids, which effect the decalcification, are derived almost entirely from amylaceous and saccharine substances, retained in the fissures and defects, or on the surfaces of the teeth, and which undergo fermentation there. It is no new idea to regard the acids formed from sugar as being especially injurious to the teeth. Miller considers that starch is more detrimental to the teeth than sugar, particularly as sugar, being readily soluble, is soon carried away, or is so diluted with the saliva as to be rendered harmless, whereas amylaceous matter adheres to the teeth for a greater length of time, and consequently exercises a more continued action than sugar. Fermentable albuminous substances mixed with the saliva develop but small quantities of acids, which soon disappear.

"The second stage of caries, namely, the dissolution of the softened dentine by bacteria, is directly detectable under the microscope, and may be easily accomplished experimentally." The albuminous substance contained in the dentine forms, indeed, an excellent medium for the growth of bacteria, with the result that the soft tooth tissue is dissolved by the bacteria ferment, much as white of egg is by the gastric juice. The rapidity with which the process of destruction of the teeth advances in any mouth is evidently directly proportional to the intensity of the fermentation going on in the cavities or spaces where the food is retained, and inversely proportional to the power of resistance of the tooth substance.



The main points to be remembered are that caries is due to extrinsic or external causes, which proceed from without inwards, and that as they affect most rapidly and completely those tissues which are richest in organic matter, the dentine, of which the bulk of the tooth is composed, is more quickly destroyed than the enamel; and, further, that the action of micro-organisms plays by far the chief rôle in the production of caries. In a scientifically clean mouth, therefore, there can be no caries. Prophylactic precautions, then, must consist in judicious efforts to sterilise the mouth, for it is obviously impossible to confine the diet to albuminous fermentable substances, such as flesh, eggs, etc.

With the appearance of the teeth arises the necessity for the application of personal hygienic precautions. In determining the necessity for these precautions, the mouth may be regarded as an incubator, in which not only are the conditions of heat, humidity, and oxidation perfectly realised, but bacteria and a nutritive medium are almost inevitably constantly present. Having thus acquired some idea of the nature of the disease, and the causes by which it is produced, it is well worth considering how far these latter are under our control, especially during the period of life with which we are more immediately concerned.

Faulty structure is mostly dependent upon constitutional conditions both of the parent and the child during the earliest part of the formation period of the teeth, and, therefore, is very largely beyond our control. It is important to remember, however, that, although the period of development begins particularly early in life, it is more or less actively continuous for a period of considerable duration, as the process of calcification, which begins some five months before birth, is not really complete until the age of about twenty. It is evident, therefore, that much may yet be done to improve the quality of the tooth structure, even although some injuries and defects be already beyond

repair. Both the bones and teeth, containing as they do a large percentage of earthy matter, necessarily require during the period of their growth a very liberal supply of those constructive substances to the blood which can only be derived from the food.

Those food stuffs best calculated to promote the formation of strong teeth should be prominent in the dietary of infants and children. It would take too long to discuss the most appropriate dietary; suffice it to remember that the chief article of food, the so-called staff of life, is made somewhat of a broken reed by the senseless practice of measuring its quality by its whiteness. The production of this very whiteness necessarily means an exclusion of that portion of the wheat which is richest in nitrogenous and earthy matter; while again, a dark or brown colour is no certain test of its dietetic value, for much of the so-called whole meal or brown bread is a commercial fraud. The bread made for and supplied to our prisons may be taken as a type of what wholesome bread ought to be. As oatmeal is a well recognised and wholesome article of diet, it should be remembered that while the removal of the finer bran from wheat reduces the amount of nitrogenous and fatty contents of the flour, the removal of the husks from oats has precisely the opposite effect, so that the finer the oatmeal the richer it is in those ingredients.

It is also important that the food should offer to the teeth a salutary resistance which they must overcome, since the mechanical action exercised by such food stuffs has the very best effect upon the tooth structure. It is a well recognised law of general application that every organ which we do not use ends by becoming atrophied from loss of its functional energy. The more the teeth are used in mastication the better they will be able to stand the attacks which they must inevitably encounter. If this is once rightly apprehended the importance of the first teeth becomes strikingly obvious, for as the *Lancet*, commenting on Mr.

Fisher's plea for the compulsory attention to the teeth of school children, says, in discussing this question: "If we wish to get at the root of the evil we must commence our treatment with the deciduous teeth. Many patients—nay, even medical practitioners—ask what is the use of preserving teeth which have only to serve their purpose for a time, and which nature will replace? If a surgeon were asked what is the use of provisional callus\* in a case of fracture, his answer would be readily formulated, and just such an answer is applicable to the teeth. We will run over just a few of the points that may result from disease of the teeth and its neglect. First, with regard to the child's health, with decayed teeth and often, in addition, chronic gumboils, the little sufferer is kept awake at night, and his digestion affected by inability to masticate his food, and more so by swallowing the fetid discharges from the abscesses. As a consequence the child becomes weak and puny, and so the already developing teeth suffer from the constitutional disturbance. Supposing each tooth as it becomes the seat of disease is extracted, then the masticatory power is greatly enfeebled, and moreover it has been shown that where many deciduous teeth have been removed, especially in the case of the canines,† the jaw does not develop as rapidly as it should do, and consequently when the permanent teeth erupt‡ some take their position inside and some outside the arch, which irregularity is a potent predisposing cause of caries, apart from its unsightliness. Again, take, for instance, a very common case, that of the second temporary molar, extensively decayed. The first permanent molar assumes its due position posterior, the first bicuspid anterior to it. Both these permanent teeth are frequently found affected on the side corresponding with the deciduous teeth, and the disease is undoubtedly due to the infection

from decomposing food harboured by it. Although much more might be said upon this subject, we think that enough has been advanced to show the importance of the first teeth with reference to the welfare of their successors, which should, but so often do not, do duty for a lifetime. We believe that nothing short of the periodical examination every six months, and treatment, if necessary, of the teeth of children, can effectually cope with this evil."

Further means by which we can counteract or limit the ravages of caries, are well summed up by Miller, who is our greatest authority on the action of micro-organisms of the human mouth: "By repeated thorough systematic cleansing of the oral cavity and the teeth, to so far reduce the amount of fermentable matter as to materially diminish the production of acid as well as to rob the bacteria of the organic matter necessary to their development; by prohibiting the consumption of those foods and luxuries which readily undergo rapid fermentation, to remove the chief source of the ferment products injurious to the teeth; and, lastly, by a proper and intelligent use of antiseptics, to destroy the bacteria and to limit their number and activity."

Mechanical cleansing exercises a great influence upon the process of fermentation in the human mouth and, therefore, as soon as the temporary set of teeth is fully erupted, a suitable tooth-brush supplies the best method of cleansing, which operation should be performed daily, the most efficient time being after meals.

Efficient use of the temporary teeth in mastication is important in order that both the permanent teeth and the jaws may be made stronger and better developed; it is imperative to see that no crusts of bread are left or disposed of by being dipped in tea or any other similar fluid. Statistics prove that the state of the first teeth is, in something like the two-thirds of the infants examined, already such

\* Callus, a secretion of new, bony matter.

† Canines, the so-called eye-teeth.

‡ Eruption, cutting of the teeth.



that by the fourth and fifth year their masticatory powers are seriously impaired.

Any thorough system of prophylaxis or prevention must include periodical examination of the teeth by a competent dental practitioner, more especially as the arrest of caries is, generally speaking, easy of accomplishment, if only it is taken in time, which is usually long before the process has signalled its presence by pain. If a child's denture is in such a condition that efficient use causes uneasiness or pain, it is a sign that the case urgently requires attention.

The tooth-brush is too frequently used improperly, the action being confined to a more or less superficial application of it to the external or labial surfaces of the teeth with a to-and-fro motion. Its proper application consists in its being applied to all the surfaces of the teeth as far as possible. A rotary motion is the most effective, since the to-and-fro motions merely polish the surfaces which the motions of the lips, cheeks, and tongue keep tolerably clean.

The brush should be made, first of all, to impinge upon the gum, and then be carried towards the masticating surfaces with a rotary motion. The upper teeth must therefore be brushed from the gum downwards, and the lower from the gum upwards. The to-and-fro motion will suffice for the cleansing of the masticatory surfaces.

With regard to the kind of tooth-brush, a round handle facilitates the rotary rotation, and the bristles should be of medium stiffness, not too hard, otherwise the gums may be unduly lacerated. By dipping the brush into hot water the bristles may be softened to the proper consistency. It should be remembered, however, that one is more likely to err in the selection of too soft rather than too hard a tooth-brush. Brushes with soft bristles are bad, and words are not strong enough to describe the stupidity of employing such a "make-believe" as the badger-hair brush. As a rule, most tooth-brushes are made with an unnecessary

number of bristles, and the bundles of bristles are too close together, where they are inserted into the back of the brush. Such brushes soon become clogged towards the back with an objectionable mass of tooth-powder, epithelial scales, and food *débris*. The india-rubber tooth-brush is also of comparatively little use for cleansing purposes. The tooth-brush should never, after use, be enclosed in that wretched piece of toilet ware, known as the tooth-brush tray, but should be dried on a towel and placed upright in a rack or jar to drain, and allowed to dry, freely exposed to air and sunlight.

Frequently the use of the tooth-brush becomes perfunctory or is given up entirely, because of the gums bleeding. The more the gums bleed on brushing the greater is the necessity of not only continuing the brushing but of increasing the vigour of its application. Any extreme readiness of the gums to bleed is the sure indication of their being in a diseased state, and the vigorous brushing, with the consequent bleeding, will usually bring the gums into a healthy tonic condition in which they present no tendency to bleed.

*(To be continued.)*

## COUNTY COUNCILS.

WITHIN the next few days we shall have to go through the election of County Councils for the whole country, and as, in addition to other functions, they have to perform sanitary duties formerly entrusted to other public bodies, some remarks on the nature and scope of the Act under which the County Councils are constituted will be interesting to our readers.

Although we cannot altogether agree with the observation which fell from one member of the House of Commons during the discussion of the Local Government Act, 1888, that it is "one of the greatest measures of modern times," it must be admitted that it contains within it the germs of much future benefit to the constituencies, if properly worked, and when it has

been supplemented by an Act providing for the formation of District Councils.

There is one point about this measure, and that is, that it is essentially one of Home Rule; for by a process of decentralisation it provides for the management of various local matters by Councils elected by the inhabitants of different counties or boroughs. Further, it paves the way for the introduction of triennial elections in parliamentary, as well as in municipal, affairs.

Though the first County Councils were elected in November, 1888, they had no duties worth speaking of until April, 1889, when there was a transfer to them of all the administrative business done previously by the justices in quarter sessions, or by committees appointed by the justices at quarter sessions.

At the first meeting after their election, the Councillors have to elect a temporary chairman, and at that meeting, or at an adjourned meeting, they also have to elect, either from amongst themselves, or qualified persons outside the Councils, a number of persons equal to one-third of the total number of Councillors, styled Aldermen, and entitled to take part in the deliberations of the County Councils. But in one important particular the Aldermen differ from the Councillors, for only one-half of their number retire from office at the expiration of three years, the other half remaining in office for a further period of three years. Great opposition was raised to this proviso when the Bill was passing through the House of Commons, and there seems no particular reason why two distinct classes should exist in the Councils. The only argument advanced which appeared to have any weight was that at the election of Aldermen an opportunity would be afforded of bringing good men from outside. But this is specious logic only; and, unless the Councillors show a proper regard for themselves, there is the risk of a number of persons being elected Aldermen, who accept the position from motives of vanity or self-interest, and who

have not received the stamp of popular election. Any vacancies in the rank of Councillors created by their election to that of Aldermen will necessitate fresh elections by the constituencies of representatives to fill up their vacant places, thus causing a most unnecessary trouble and expense. If the Councils consisted of Councillors only, all elected at the same time, it would certainly be preferable, if only for these reasons.

The powers and duties of County Councils include the making and levying county and police rates, and the expenditure of money so raised; the control of existing county halls, assize courts, justices' rooms, and police-stations, or their erection where required; the granting of music and dancing and race-course licenses; the provision, maintenance, and management of pauper lunatic asylums; the establishment and maintenance of reformatory and industrial schools; the erection and repair of public bridges and roads; the appointment and payment of coroners, medical officers of health, analysts, inspectors, and all other county officials except the clerk of the peace, or the clerk of the justices; the arrangement of polling districts for parliamentary elections; the execution, as local authority, of all Acts of Parliament relating to contagious diseases of animals, to destructive insects, to fish conservancy, to wild birds, and to weights and measures, and gas meters; the assessment of damages under the Riot Act; the registration of rules of scientific societies, and of charitable gifts; the certification and recording of places of religious worship, and the confirmation and record of the rules of loan societies.

The money for all these purposes is raised as follows:—The income from certain sources of revenue, (licenses, etc.) which went into the Imperial Exchequer up to the establishment of County Councils has been diverted, and is now paid over to the County Councils by the Inland Revenue department, and the amount thus produced is further augmented by the grant to



the County Councils of a portion of the probate duty.

Although the formation of County Councils is a decided step in the right direction it is evident that it cannot be regarded as complete, and that an additional measure will be requisite, when it is to be hoped that the superfluous and somewhat fantastic rank of Aldermen will be done away with, and that more extensive powers will be entrusted to the County Councils.

W. A.

### CONCERNING SOME GREAT MEN'S AMUSEMENTS AND ECCENTRICITIES.

By PERCY K. BAUGH.

AT the present time, when the smallest shred of information respecting a great man's personality is so eagerly sought after and criticised, it may not be without interest to mention the amusements and hobbies which have most commended themselves to a few of the world's notabilities.

Giving, as in duty bound, first place to my own country, I will begin with the English monarchs I have on my list. Alfred the Great, like most of our kings a patron of hunting, took special delight in hawking, and besides this spent a large part of his spare time in literary pursuits for the benefit of his people, "who," he lamented, "cry for a teacher, and there is none to teach them." Among the many works which he translated from Latin into the vulgar tongue may be noted the Venerable Baeda's "Ecclesiastical History," and a history by Orosius. Henry VII. was a very steady hard-working sovereign, to whose credit Lord Verulam says: "For his pleasures there is no news of them. He did by pleasures as great princes do by banquets, come and look a little upon them, and then turn away." Nevertheless, he was fond of reading books in the French language, and, if report lies not, deeply enjoyed hoarding money, most of it acquired by doubtful means. "Gold once in

his strong boxes," remarked the Spanish Ambassador, "never comes out again." Henry VIII., when a young man, practised knightly exercises, dancing, and singing, and was quite a slave to tennis and dice, "at which," quaintly observes his biographer, Lord Herbert of Cherbury, "certain strangers used to play with him, till the King, finding them to be cheats, chas'd 'em away." But Henry was a scholar, and appreciated the new learning of his age; in 1521 he wrote "The Assertion of the Seven Sacraments against Martin Luther," a production of no mean skill, for which the Pope entitled him "Defender of the Faith"—a title still retained by his successors, though in papal eyes they have long ceased to deserve it. James I., "the wisest fool in Christendom," in addition to thinking himself possessed of marvellous argumentative powers, which he delighted to exhibit, was particularly proud of his abilities as a theologian, and left behind him several volumes of pedantic, ill-arranged controversy, which have all gone into obscurity. The unfortunate Charles I. had a taste for picture collecting. James II. showed much interest in ship-building, and the regicide Cromwell liked music and practical joking, the latter probably as a relief to the constant strain on his mind. On one occasion, indeed, he undertook to drive a carriage with Secretary Thurlow inside, and succeeded in overturning the equipage. It might be supposed that Charles II., amidst all the gaiety and profligacy of Whitehall, would have found no opportunity for any more serious pursuit, but, as a matter of fact, he was a dabbler in chemistry, and had a private laboratory in which to carry on his investigations. William III., who cared nothing for literature, went in for landscape gardening; to him Kensington Gardens owe their present extent, having been considerably enlarged through his munificence. George III.'s chief recreation was farming (whence his familiar nickname, "Farmer George"), and George II. often amused himself by counting and recount-

ing the money he had in his pocket. This habit is said to have brought him an open remonstrance from one of his subjects: a lady in his presence became highly worked up by the continual jingle of coins, and told him plainly she must leave the room unless he desisted.

Next, let us take a glance at foreign princes, and see what they offer. Going back to ancient history, we find that Alexander the Great was an admirer of Homer's "Iliad," a copy of which he always carried with him on his marches. His family traditions ran that he derived his descent from the hero Achilles, upon whose merits, as depicted by the blind poet, he endeavoured to form himself. We learn further that King Aretas of Arabia was fond of currying horses, Artabanus of Persia of catching moles, and Domitian of Rome of catching flies. Innocent III., the most powerful of all the Popes, enjoyed playing ninepins, and would converse for hours outside the Vatican with an old monk, to whose worthless babble he paid the strictest attention. Ferdinand of Aragon relished hunting; but the only sort of reading he cared for was history. Louis XIV. had a taste for building, and his son, Louis XV., took a decided interest in road-making and map-drawing—one of the few good points recorded of an evil king. To his hobby France is indebted for several of her best highways. Charles V. of Spain, after having abdicated his throne in favour of Philip, devoted himself to mechanics, and was an expert maker of clocks, barometers, balances, and other instruments. Poor Louis XVI., when he could free himself awhile from the cares of monarchy, would half strip, and, covered with grime, oil, and smoke, pass the time in his favourite recreation of a locksmith, under the tuition of a man who finally betrayed him to his enemies. The mighty Czar Nicholas was wont to amuse himself by studying mathematics, fortifications, and architecture—a form of relaxation which would, I think, be too stiff for most people. Frederick William of Prussia had a mania for collecting

tall men, whom he drafted into a regiment of giants; for these big fellows he scoured Europe, and was deeply offended when George II. objected to his sending recruiting officers all over Great Britain. His inclinations lay wholly in a military direction: "The business of life, according to him, was to drill and be drilled," says Macaulay. His son, Frederick the Great, was an accomplished flautist; but, as a boy, he lived in terror of his father, who hated the fine arts, and whose parental fondness vented itself in kicking, half-strangling, and generally illtreating his children. Once the lad was caught practising his beloved flute, which was immediately broken and flung into the fire. In later years, so the historian Becker tells us, it was his custom to play from room to room, and while he played, he would think over complex matters of state, until, under the magic spell of the music, he would see his path growing clear before him. As a writer he posed with moderate success, and was for a short time on good terms with Voltaire. A quarrel arose, however, and Frederick having despatched some verses to the French poet for correction, "See!" sneered he, "what a quantity of his dirty linen the king has sent me to wash." Napoleon Bounaparte appreciated music, of which he was something of a critic. Like Cromwell he attempted to play the coachman, and like Cromwell he came to grief, whereupon he merely observed: "I believe everyone should confine himself to his own trade"—a truly characteristic and philosophical remark.

Leaving kings, popes, and emperors, and descending to ordinary mortals, I have a fresh field to select from. I need hardly mention Mr. Gladstone—who has not heard of the Grand Old Man's woodcutting exploits? Among famous devotees of rod and line may be noted Walton, Herbert, Paley, and Dryden, the latter quite celebrated for his fishing parties. Thomas Warton, author of "The History of Modern Poetry," was often to be found drinking in



taverns, a taste which he shared with Turner, the painter. Charles Lamb was an admirer of London, and never wearied of wandering about the streets. Without London he considered life would scarcely be worth living; he "would not exchange the dirtiest drab-frequented alley for Skiddaw and Helvellyn." Johnson was another eulogist of the Metropolis, and it was down Fleet Street that he took his daily walk, which, owing to the series of tasks he made compulsory on himself, was a really curious performance. First, every post required to be touched as he passed it; next it was a point of honour to step exactly in the middle of each paving slab; and, lastly, as he approached his destination, a series of graduated strides had to be employed in order to reach the door with one particular foot. Godolphin, the statesman, spent much of his spare time in the cock-pit. Pope, like William III., was fond of landscape-gardening. His garden of five acres at Twickenham was so laid out that it seemed a number of lawns opening one beyond another, and surrounded by dense forest. He made use of mock classic temples and obelisks at convenient points, and his best piece of work, a grotto of shells—in reality, a tunnel under the high road—remains to this day. Inside the grotto were mirrors and pieces of glass, which, when the doors were shut, reflected the landscape, and, when the interior was lighted up, sparkled with the utmost brilliance. Pope was very proud of this erection, for whose adornment his friends sent him pieces of spar, marble, and coral from the mines of Cornwall and Devonshire. Cowper was evidently a practical man, and combined amusement with utility, being no less a person than his own window-mender. Prior, one of our best minor poets, whiled away his evenings at a low public-house in Long Acre, chatting with an old soldier and his shrewish helpmate. Burke, when at his country estate, Beaconsfield, transformed himself from a politician into an enthusiastic farmer, and "the reader"—here I quote from a work by John

Morley—"may smile as he recognizes the ardour, the earnestness, the fervid gravity of the political speeches in letters which discuss the merits of carrots in fattening porkers, and the precise degree to which they should be boiled." Wordsworth, Dickens, and Longfellow were immense pedestrians. Wordsworth did the major part of his writing in the open air; a visitor, who called to see the poet's study, was shown a small room, home of a few tattered books. "This," said the servant maid, "is master's library, but his study is out of doors." Dickens liked the sights of a London walk, and was also fond of a tramp on the sea downs. Carlyle invariably covered several miles before beginning work, and enjoyed riding inside an omnibus, while Victor Hugo preferred the outside. No weather could detain Buckle from his fifteen minutes' constitutional before breakfast, and Macaulay was likewise a great walker, always accompanied, however, by a volume of some sort. Shelley used to sail paper boats on the Serpentine, and took as much interest as a child in their safety. Sir Walter Scott's chief pursuits were riding and coursing; his dogs and he appear in the same pieces of sculpture, testifying to his habits. Later in life he patronised gardening, in which the American historian, Bancroft, has since borne him company. Milton sought relaxation in the companionship of the "pealing organ," and Byron amused himself by shooting at a piece of money fixed in a stick, and practised this more persistently than he ever did anything else. Of present celebrities, Mr. Chamberlain is an amateur horticulturist; Sir John Lubbock passes the flying moments in studying his ants and bees; Mr. Black enjoys yachting among the Hebrides; and many of the nobility have a pronounced fancy for horse-racing.

Lastly, I come to a few curious recreations. Ferdinand VII. of Spain had a fondness for embroidering petticoats; and Burton, author of "The Anatomy of Melancholy," took pleasure

in listening to the profanity of the bargemen at Folly Bridge, Oxford. The Italian painter, Leonardo da Vinci, enjoyed watching the dirty, polluted streams that issued from the slums of Venice. Peter the Great, when stopping with Sir William Temple, discovered nothing more to his taste than being wheeled in a barrow all over his host's flower-beds. Jean Jacques Rousseau, after having collected a number of heavy stones, would climb to the top of a cliff overlooking the sea, and then, lying flat and peering down, would drop the stones one after another, feeling the highest delight as he watched them bound from point to point, and finally disappear with a splash. Swift used to harness his servants with cords, and drive them about from room to room in the deanery. Cardinal Mazarin amused himself by withdrawing to his *sanctum sanctorum*, arranging the chairs, and jumping over each in turn. On one occasion, having forgotten to lock the door, he was surprised in his unseemly exercise by a courtier, who, unknowingly, entered the room. The situation was awkward, for Mazarin was both haughty and eccentric; but the young man, feigning the deepest interest in the proceedings, exclaimed with ready wit: "I will bet your excellency five pieces I can beat that last jump." "Done!" cried the Cardinal, and next moment they were engaged in a leaping match, which the courtier was, of course, careful to lose. No long time elapsed, however, before he was presented with a bishopric, and thus he achieved his fortune at a single stroke. Philip, the great Duke of Burgundy lavished large sums of money in building houses full of trap-doors and pitfalls; into one of these mansions he would invite some unwary stranger who would soon find himself being tumbled through floors, deluged with water, and banged with sacks, until his unfortunate head was all in a whirl with terror.

But the story of the royal pork-butcher eclipses every other. Charles VI., King of Spain and the Indies, had a brother named

Don Antonio, who excelled as an amateur sausage maker, and after a while nothing would please the king but that he too should be initiated into the secrets of the wonderful art. He hoped ultimately, he said, to produce sausages which should rival, nay, even excel, his brother's. Accordingly, a pavilion was built in a secluded part of Aranjuez, whither, liberally supplied with choppers, pigs, and the necessary spices, the monarch retired from public view, and, dressed in a butcher's white blouse and apron, went through a severe course of training. At last he was ready for a test, and a piece of sausage solemnly tasted by Don Antonio was declared worthy of his own making. The dish became fashionable at court, but Charles, insisting that he had not yet acquired his brother's delicacy and finish, continued his labours towards the perfection of his culinary skill. One day the king, at table, began to find fault with his sausages. Naturally the courtiers all demurred at this, and declared that he was mistaken; but a young duke, who had just come up from the country, and did not know how matters stood, thought he saw an open road to favour, and remarked: "I venture to agree with your Majesty." "What would you do to the cook?" asked Charles. "Expel him," was the reply. On this Charles rose from his seat, left the hall, and quickly returned in his professional costume. Approaching the bewildered young man, he said: "Sir Duke, will you beg my pardon of the king?" "Mercy, sire!" cried the duke, throwing himself on his knees. Charles good-humouredly passed over the offence, and made the culprit one of his personal attendants. This whim degenerated into sheer monomania; matters of the gravest importance were neglected; the king could not be got away from his self-inflicted labours; sausage-making became the sole interest of his existence. In the end, however, he was undeceived by a fortunate occurrence. An English lady of rank, who was very curious to see the royal pork-butcher at work, was secretly introduced



by the British ambassador into the grounds surrounding the pavilion. By some mischance Charles discovered her, and, thinking it the best thing to do, went up to her and embraced her, forgetting that his hands and clothes were all smeared and dirty. Of course, the lady's dress was spoilt; but Charles had recognised how utterly absurd he must seem to other people, and his eyes being thus opened, he at once desisted from his degrading occupation. Nevertheless, during his absence from business, feeble prince as he was, incalculable damage had been done to the empire—damage from which she never recovered under his after-rule.

### ATHLETIC SPORTS IN RELATION TO PUBLIC HEALTH.\*

By HENRY HOOLE, M.D. (LOND.),

Author of the "Science and Art of Training."

(Concluded from page 41.)

#### PART II.—MODERN ATHLETICISM.

ONE feature which has characterized the present century has been the marked revival of outdoor recreations, and to this, in a great measure, may be attributed the improved physique of the English middle class. Statistics compiled about forty to fifty years ago gave, I find, the following averages:—

Lower middle class:—twenty to twenty-five years; height, five feet eight and a half inches; weight, ten stone seven pounds.

Upper middle-class:—twenty to twenty-five years; height, five feet nine and a half inches; weight, ten stone ten and three-quarter pounds.

While at mature age, viz., the thirtieth year, the standard of chest measurement adopted at our insurance offices for a man of five feet nine inches was thirty-nine inches. The difference

of social status had, therefore, up to about 1850, only slightly increased the bodily development of the upper middle class; but whether the same will be said a few years hence I have considerable doubt, for, since the compilation of these statistics, each generation of the more favoured section has exhibited material physical improvement.

The great expansion of athletic sports dates, however, from just upon the year 1860, and by many is thought to be contemporary with the birth and spread of the volunteer movement. Be this as it may, a multiplicity of causes was in operation. The removal of the stamp tax and the paper duty had created a demand for cheap literature, national prosperity had shortened the hours of labour, and the facilities for travelling were greater. Whatever the cause or causes, the newspaper press and other branches of trade interested in the growth of muscular games speedily saw the rich harvest to be reaped by ministering to the popular bent. At that time there was no daily paper exclusively devoted to sport; one was published twice a week, but it had not been in existence a year. The remaining literature consisted of three or four weeklies, with the same number of monthly magazines. The oldest and most read of the latter, so meagre was copy, had to fill its pages with reports of horse-racing, with articles on natural history, with criticisms of plays, and with reviews of books. What is now the condition of sporting journalism? Excluding papers devoted solely to the turf, the sum total amounts to five daily papers, one bi-weekly, forty-six weeklies, a dozen or more monthly, and an equal number of annual, periodicals. A glance through the advertisement columns of this ever-growing industry reveals at once the enormous increase of trades, the existence of which depends upon the pastimes of our youths.

Thirty years ago, outside the public schools and the colleges, there were very few athletic clubs. To-day each game counts them by the

\* Part I, "The Evolution of Skilled Muscular Exercise," appeared in the February number of *HYGIENE*. It should be mentioned that this article is the substance of a lecture delivered some time back, under the auspices of the useful association known as the Sunday Lecture Society.

dozen—by the hundred; and these again are combined into Associations, Alliances, Leagues, and Tournaments.

To meet the requirements of the enthusiasts of sturdiness of limb, grounds, the property of the clubs, of private individuals, or of companies, have been established in great number throughout the country. Naturally, such a rapid development of the public taste has vastly affected sport, the athlete, and society. In the year 1866 the London Athletic Club systematised the principal out-door games, and recorded the best performance in each. It is therefore easy to trace any falling off or any improvement in this respect. Year by year contests have been done quicker or more deftly, and out of eighteen records of different forms of athleticism twelve were made during the last four years. Again, many ancient pastimes, as hockey and golf, which in England at least were fast becoming obsolete, have not only been revived, but their use has been widely extended; while new ones, as lacrosse, cycling, and lawn-tennis, have been introduced.

The implements of sport and the facilities for recreation have likewise improved. To these, and to the fact that a hundred compete now where one contended thirty years ago, must be attributed, in some measure, the finer physique and the greater prowess of our modern athlete. Francis Galton, an authority on such matters, gives interesting evidence of this amelioration of the upper middle class. When he was an undergraduate at Cambridge from 1840 to 1844, although but five feet nine and three-quarter inches in height, he was taller than the majority of his fellows. In addressing them he habitually lowered his eyes, and, if in a crowd, he could readily see over the heads of the people. Writing in 1883, he states that he no longer possesses these advantages. Altered social conditions, in his opinion, have helped to improve the bodily powers and address of this class; such conditions, for instance, as more wholesome

and abundant food, better cooking, warmer clothing, moderation in the use of alcohol, better ventilated sleeping rooms, more change through holidays, and lastly, the healthier lives led by women in their girlhood. With this physical progress there has been a corresponding moral one: the youth of the leisured order is not now so addicted to the idle habits, the bad language, the gambling, and the unmanly amusements of his forefathers. Exercise has taught him to be choicer in his dress, and perhaps more lavish in the use of water. The purer mental tone has insensibly permeated more or less other grades of society, and the streets of large towns are not so thronged as they were with drunken and dirty roughs.

The prominence given to all bodily exploits by the sporting and general press has likewise directed public attention to the question of physical education. At the present time parental disfavour does not fall upon the youth who exhibits an inclination for the cricket field or the river. In his father's days a similar taste was often regarded as the signs of an idle or reckless nature, and sternly discouraged. This is all changed. Cricket and rowing are now deemed as essential for the lad's future welfare as a knowledge of arithmetic, and, what is also a great social gain, the privilege of out-door pursuits is in many cases extended to his sister. Principals of schools have been quick to discern the public tendency, and their advertisements and prospectuses make a great feature of gymnasia and large playgrounds.

Such, briefly, are some of the substantial results of this great revival and extension of athletic sports. Whether the benefits have been equally distributed or not among the whole of the middle class, will, however, be better seen after a consideration of a few of the agencies which have encouraged the popular taste.

An enormous amount of capital has been sunk, and is being sunk, in sporting journals, in the manufacture of sporting goods, and in



the creation of athletic grounds and institutions. These industries do good beyond all question, by supplying a public want, by employing workpeople, and by adding to the prosperity of the country. On the other hand, there is every reason to suppose that the supply is far in excess of the demand, and that the latter is unduly stimulated by means detrimental both to our national pastimes and to the public health.

The unprejudiced reader of a sporting paper must be struck with the novel and unmerited dignity which is given to mere diversions. His eye is greeted with lithographed portraits not only of leading athletes, but of youths of the ninth or tenth rank. Biographies of the latter relate the successes and the trivial events of their short life; and the writers of these sketches have indeed to exercise much ingenuity, for the materials are scanty, and details carried too far back would find the subject of their praise in the nursery. Our ablest journalists are also pressed into the service. Pens which yesterday were engaged in illuminating with power and lucidity some dark political situation, are to-day exalting, by picturesque and graphic phrases, the struggles and vicissitudes of a football match. The educated world is astonished at the literary display, but probably not more than the *littérateur* himself. Nor does the new journalism end here. Contemptuous epithets are liberally bestowed upon the more sober relaxations of those who have neither the liking nor the aptitude for Olympian games. Unless a Juvenal comes to the rescue, will not foreign critics alter their accusation, and say, not "that in England they worship the horse," but "that they worship the athlete"?

The implement maker, in order to push his wares, subsidises a stripling renowned in his special pastime. Should the agent be successful in the contest, his name and the name of the instrument used are made notorious in the sporting press throughout the length and the breadth of the land by advertisements, and

by paragraphs which are generally disguised advertisements.

Another method of stimulation, and one much favoured by all the industries dependent on sport, is the draw of valuable prizes, and of gold medals for best records. Hundreds of pounds are in this way expended in one afternoon's meeting; and usually the popularity of the machine, the increased sale of the paper, or the large amount of "gate money" more than repays the outlay.

National recreations are unduly fostered by other means. Clubs and associations appear to be infected with an intense feeling of rivalry, and, in order to maintain their reputation, descend to very dubious practices. Salaried posts are found for their skilled members, prominent players are enticed from opposition clubs, and promising beginners, irrespective of their young age and want of stamina, are effusively welcomed.

Within recent years, too, the leisured classes have made regattas, pedestrian contests, assaults of arms, lawn-tennis tournaments, bicycle races, more and more places of fashionable resort. Each sport has its titled and wealthy patrons, while the social regard extended to the latter day possessor of stalwart frame and iron muscle, almost compares with the favour shown to the gladiator in the days of the Roman Empire.

To these agencies I ascribe the forgetfulness of the motive of exercise; the conversion of recreation into an arduous and exacting pursuit; the degeneration of rational emulation into a fierce competition; the alteration for the worse in the character of some of our pastimes, and the grafting upon them of eccentric offshoots. I cannot, perhaps, better emphasize these assertions than by giving instances drawn from cycling, football, and swimming.

Of all the articles designed for open-air amusement, I know of no more beautiful piece of mechanism than the bicycle. Its use is easily acquired, its cost within the means of nearly

every one, and its practice available both to the young and old throughout the greater portion of the year,—yet, in many cases, its possession, if the owner be a young man, appears to develop a desire to cover distances, more or less far, in the shortest possible time; and despising the pleasure of moderate indulgence he scours the country indifferent to scenery, to blinding dust, and to scorching rays. Although one of the latest of our out-door games, it surpasses them all in its number of competitions, and in its records. Records for all sorts of machines, and for all kinds of distances—from the fractions of a mile to a hundred or more—while gold medals and championships are awarded with bewildering profusion.

The record breaker, attended by his time-keepers, his pace-makers, is fast becoming a common object on our country roads. With eyes staring fixedly on the ground, face red and perspiring, the body crouched over the handle of the machine, his legs violently working, he appears the moving realization of toil and distress. The thoughtful observer must ask himself, What has this health-giving recreation done to deserve such degradation? What charm can exist in such labour? And what benefit to the mind or the body can possibly result from it? To tax still further the undeveloped heart and lungs of growing lads, another absurd variation in competition is practised, namely, hill climbing. One instance of this will suffice. In 1889 twenty-one cyclists raced up one of the Surrey hills, the gradient of which in the steepest part was one in seven, and the distance of the course three-quarters of a mile. Can folly farther go?

The Rugby form of football has within recent years acquired an unenviable notoriety for broken limbs and fatal accidents. When played, however, in a reasonable manner, with manly consideration and absence of temper, its dangers are proportionately decreased, and the football field becomes certainly a splendid school for developing hardihood and courage. The great

turn of speed and the bodily elasticity possessed by lads from sixteen to twenty materially lessen for them some of the hazardous features of the game. But played as Rugby and Association football now is, by powerful heavy men, with scant courtesy, almost ferocious rivalry, and in long competitions for challenge cups, both forms of the game can only be regarded as dangerous and brutal pursuits. Should the player be lucky or hardy enough to escape apparently the mishaps and exposure of the recurring weekly cup encounters, and be able to contend in the final match, he cannot yet be said to have passed through the ordeal unharmed. Repeated dashings of the body to the ground have violently shaken the delicately organized brain and spinal cord, and the internal viscera; and these concussions, approaching in severity at times those of railway collisions, are in after years the cause of lessened mental and physical energy, impaired memory, and even paralysis.

What is a more enjoyable recreation on a warm summer's day than swimming? It brings into action, without risk of injury, nearly every muscle of the body, while the loss of heat from the brief immersion is hardly discernible, and rapidly made up. The good derived from it threatens, I regret to say, to be speedily neutralised by the senseless practice in our variable climate of long-distance swims, and of water-polo tournaments. One of the primary laws of heat is quite disregarded; and the dangerous cooling of the surface of the body seriously congests the nervous system, as well as the lungs and kidneys. Is it to be wondered at if these exhibitions are followed by sickness, weariness, exhaustion, and at times by death? Objectors to this statement will instance the long hours spent in the water by savages and natives of southern climates, and will likewise remind me that Captain Webb during and after the Channel swim never felt cold.

Let me point out that the free exposure of



the body for a few moments to a tropical sun restores the lost heat, and also that the gallant swimmer was a man of extraordinary vigour and of an exceptional physique. A leading surgeon, accustomed to the examination of well-proportioned and vigorous men, has recorded his astonishment at, and admiration of, the bodily endowments of the late Captain Webb. If five per cent. of our water-polo and long-distance swimmers can show the same endowments, and if in this country we have each summer two months of continuous warm weather, I will retract the above assertion.

Time will not allow me to notice other erratic diversions from genuine recreations. Let me, however, protest against public foot races for boys under fourteen, and for men over forty. The exertions are likely to be attended with serious consequences to the runners, while the races, from their very nature, cannot be a pleasant sight to the true lover of sport.

Emulation, I am fully aware, is inseparable from all actions of men, be they of vocation or of pleasure. It gives a zest to exercise, and, when kept within reasonable limits, promotes the attainment of robust health. But the old-world emulation, the natural desire to exhibit superior dexterity for honour and not for reward, has been converted into a feverish competition as much for social regard as for valuable prizes. And this competition is sustained at a dangerous point by the capitalist, who looks upon the athlete as an instrument for maintaining the steam power of his factories, by the clubs who desire his services to preserve their prestige, and by the wealthy idlers who see in him the means of making less tedious their slow hours of leisure. Adventitious influences like these are inducing lads not out of their teens to indulge recklessly in undue bodily exercise, and to incur such departures from health as faintness, loss of appetite, restlessness, and high fever, if not more serious maladies.

Any one who has watched the desperate struggle for mastery near the winning-post at Henley or at the meetings of the Amateur Athletic Association can testify to the severity of the strain upon the human organism. The men who pass unscathed through this are decidedly the highest product of the physical development of the present age. Their number is few. During those brief seconds that seem to the contender so long, the lungs are distended to their utmost by the deep and sustained breathing; the pressure thereby upon the contents of the chest is enormously increased, as shown by the bloodshot eyes, the swollen veins of the face and neck, and by the rapid pulsations of the heart, while the brain is conscious of nothing but the resolve to do or to die.

Should the athlete be unsound or untrained, something gives way—a valve of the heart, the wall of a blood-vessel, or the tissue of the lung; and in the majority of such cases you may write twenty years off the life expectation of the sufferer.

A knowledge of the principal changes which occur in the body when the boy is growing into the man will best illustrate the risks of these dangerously superb athletic achievements. The so-called "period of puberty" extends from the age of fourteen to twenty. Up to sixteen the growth is rapid, and in these two years the lad gains four and three-quarter inches in height, three inches in girth of chest, and 28 lbs. in his weight; after then the changes, although speedy, are at a slower rate, but the expansion of the chest is never in proportion to the increase in height. Throughout the whole stage of puberty the requirements of the bones and muscles are extreme,—requirements that the organs of digestion and assimilation cannot always adequately meet, although at no other period of life do they perform their functions so vigorously or so well. Owing to this diversion of all the available vital energy, and owing likewise to the insufficient growth of the chest, the brain, heart, and lungs are rather

backward in development. The future mental and bodily calibre of the lad can therefore only be conjectured. The exhaustion from rapid growth is very great, and is especially evident at the age of sixteen, or if the lad be tall. Its signs, and those of immature condition, are a low bodily temperature, feeble circulation—the hands and feet being habitually cold—inaptitude for mental or physical exertion, lassitude, headache, palpitation, and breathlessness. The nearer the age of twenty the less pronounced are these symptoms; nevertheless, during the entire period of puberty, the bones remain only partially consolidated and the muscles only partially mature. These anatomical facts account for the distorted ribs, the round shoulders, and the weak loins of striplings; and, as the muscles of the limbs are more in advance of those of the trunk, prove the assertion “that growing boys are good runners but poor wrestlers.”

It is needless to say great precautions must be taken to tide the boy over this critical phase of his life. He should be warmly clad, be circumspect in the use of cold baths, and avoid exposure. His diet should be ample, carefully selected, and contain a large proportion of animal food. Above all, he should have plenty of rest, and refrain from arduous mental or bodily labour.

This delicacy of constitution is well known to army surgeons; one indeed has expressed the opinion that if recruits of eighteen be not discharged they are doomed to spend in hospital two to four of their succeeding eight years; while Napoleon I. stated that conscripts under twenty served but to strew the roadside and to fill the infirmaries.

The above remarks are sufficient, I think, to demonstrate the risks run by lads in severe competitions.

Upholders, interested or otherwise, of our modern sports may join issue upon the question of the health of athletes, and may quote the

results of a few able inquirers into this matter. To my conscientious opponent I will point out how misleading in many ways are the conclusions of these writers. Their investigations were completed in the very infancy of this great expansion of athleticism; and, in addition, were restricted to what forms now an extremely small section of competitors—namely, the sons of members of the leisured class. Moreover, in most instances the athletes were over the age of twenty.

Let me examine more closely the life history and surroundings of this selected type. Born and brought up in pure country or seaside air, he inherits often a fine physique and a disposition for exercise. While every facility is given for gratifying this desire, his developing bodily powers are carefully nurtured; and then, at an age when most lads are earning their living, he enters a public school. Here he comes under the guidance of teachers who possess an excellent knowledge of manly games, and of a doctor skilled in the ailments of lads. Protected from unequal competition, mental labour restricted, well housed, and well fed, he is able to spend fifteen to twenty-five hours each week in the playground or on the river.

These conditions are naturally favourable to the development of large bones, powerful muscles, and exceptional stamina. Nor is the physical education yet completed. At eighteen or so he joins a University, and devotes, during the ensuing four years, a large portion of his time to bodily culture. In the critical years of puberty exercise has been taken with regularity, and often with moderation; so in perfect health he commences adult life when the severe labour of modern sport and the variations of seasons can be borne, if not with pleasure, at least with comparative ease. His now more mature intellect protects him from the seductions of social or journalistic adulation, and his position places him outside the range of the manufacturer's attraction. The preparation for the world's struggle has been a costly one, but, if his after-



life is to be that of the administrator, the leader or the teacher of men, it has been at least a rational one. Early inculcated habits of discipline, of endurance, of self-reliance, and of hardihood will prove of inestimable service; and other things being equal, the man may become the *fons et origo* of a superior race.

If, however, one section of society has benefited by the gospel of physical education so recklessly preached, another and a much larger one has suffered. From the great lower middle class—the class which supplies ninety per cent. or more of the aspirants for athletic renown—let me select another type.

Born of city parents, and reared in the atmosphere of crowded streets, the lad, even if he is fortunate enough to inherit breadth of frame or power of sinew, has few opportunities either for exercise, or for the cultivation of his natural endowments. His childhood is passed in schools that know not the doctrine of muscular tuition, or where, owing to the great value of land, the playgrounds do not admit of the doctrine being properly expounded. From force of circumstances he enters business at an early age, and spends a large portion of the day in workshops, warehouses, or offices where much in the way of lighting and ventilation is to be desired. Nature, however, clamours for the working of his growing limbs, so this is sought in the late hours in the evening, when both mind and body are fatigued by the labours of the day. Should, however, his surroundings be more propitious or his sturdiness above the average, he probably becomes proficient in some pastime, and the notoriety brings him within the sphere of attraction of those agencies which, in my opinion, have unduly stimulated our national games.

Can one be surprised if the unripened intellect of the lad failed to preserve him from such powerful influences? An athlete *in esse* he becomes a champion or record-breaker *in posse*. Sport is an exacting mistress, and, as mentioned before, contests grow keener each year; so,

despite the sacrifice of time, of money, and often of health, he can barely keep within the third rank of competitors. He has no comfortable training-quarters at the seaside or in the country, no choice selection of food, and no skilled advisers. His practice must be taken where and when possible, and the day following the supreme effort finds him, not recruiting his strength at a health resort, but resuming his work in a narrow city street.

Long before the age of maturity is attained the young seeker after physical glory finds rival pressing closer upon his heels, for, slightly altering the quotation—

“Competition hath a thousand sons, that one by one pursue.”

His vigour and skill, instead of increasing during the next few years as they should, are unmistakably on the wane. His reign is over; it was but a brief and fitful one. Social attention and press flattery are diverted to other champions who have lowered his record; admirers no longer minister to luxurious habits which they have engendered, and his own purse cannot supply them. Notoriety and adulation have made him impatient of advice or control. He despises the monotonous routine of commerce, and brings to it no acquired ability. Should he have escaped the accidents or the ailments incidental to his previous pursuits, his capital to begin the world with is a muscular body, a fallow brain, and a cabinet full of prizes. In the majority of cases, I regret to say, the social disadvantages have been too great, and some grave physical injury has resulted. This, if it does not lead to premature death, will grievously handicap him in the race for life and for competence. It is not in this direction one may look for the mental and physical amelioration of our prosperity.

With pleasure I now turn to a brighter outcome of the popular taste for outdoor amusement. As far back as 1864 a committee met at Berlin to examine the subject of physical

recreation in its relation to women. The result of the inquiry may be briefly summarized. Girls in large towns were found to be more liable than boys to disturbances of health; while certain diseases, as weakness of the nervous and muscular systems, want of red blood, defective growth, curvature of the spine, and asthma, were in them ten times more common. It likewise traced the after-effects of these maladies both in the mother and in her offspring.

The cause of this, the committee pronounced to be the neglect of physical recreation between the ages of six and fifteen. To counteract the evil it recommended to the Government the adoption, in the education of young girls, of gymnastic and open-air games, swimming, and skating; but stipulated that the exercises should be methodical, proportionate to the age and strength of the child, not dangerous or indecent, and not too violent.

It augured from the use of these measures a higher standard of health, a reduction in the number of the before-mentioned diseases and deformities, an improved muscular system, more graceful movements, a better figure, and a more evenly balanced mind. Owing to the alteration of opinion in this country as to the recreation of young girls, the advice of this German committee has for the last thirty years been unwittingly followed. The soundness of its conclusions is exemplified in the grace, the strength, and the health of the present generation of English women. Apart from the social improvement of all classes, it is easy to account for these good results. Class differences are not so markedly felt in the work of women as in men's; indeed, the advantage, if any, is probably on the side of the maiden of humbler life. The needs of the household require active help, and this muscular labour is calculated to make her robust and vigorous. Her duties are neither so exacting nor so responsible as those of her brother; she, therefore, thrives better on the plain unvaried diet, and besides, has greater

facilities for taking exercise at more seasonable hours. The trying period of rapid growth comes on with her much earlier, and does not last so long; while a natural instinct in her parents leads them to shield her during this critical time from either mental or bodily excess. Again, women's pastimes have been more slowly evolved. Their selection is still very limited; and neither social favour nor personal taste inclines towards those requiring violent exertion. Her friends, up to the present, find no gratification in seeing her chest bedecked with medals; clubs are not eager to secure her services; she is not subordinate to the interests of vested capital; and, if one omits lawn-tennis, she has not yet been infected with the fever of competition. Moderate indulgence and sensible emulation have given to the modern Atalanta a graceful form, a sound constitution, and a healthy mental tone—incalculable benefits, as she will discover, when the responsibilities of wife and mother fall to her share. Great as the advantages of physical culture have been to the girl, there is still much more to be done. The prejudice against her sharing in any of the out-door recreations is not wholly removed; and she has yet to be protected from those evils which have already overtaken her brother.

No one, I feel sure, will deny that all forms of bodily address have reached a high degree of excellence, and that superior athleticism, like many other transcendent things, has now become a luxury.

The athlete of the future will have seriously to consider the nature of the task before him, if he desires in safety to equal or surpass the exploits of the present generation. From what section of society he will come is a matter of conjecture. For my own part, I believe that favourable conditions of life must tell, and that we must look to the narrow ranks of the wealthy class to furnish the champion.

Far, however, from further stimulating the future evolution of athletic sports, I would urge measures to impede it, and to discounten-



ance competitions. With this view I make the following suggestions to our leading athletic clubs and associations. Let there be no great discrepancy in the ages of your active members; abolish competitions for challenge cups, and for youths under the age of twenty; do not favour any eccentric departures from legitimate pastimes; let your prizes approach in simplicity and cost the olive garland of the Greeks; and, in the interest of sport, make more rigid the line of demarcation between amateur and professional athleticism. To the latter relegate costly prizes, gold and silver medals, championships, the making and breaking of records, erratic diversions, and the furtherance of the interest of sporting industries.

I would likewise suggest the appointment of a Commission similar to the one held in Berlin, to investigate the whole question of our national recreations, and to discover and make widely known what in them is good and what is evil.

Finally, to every aspirant to physical glory I would say — Ascertain, ere you descend into the public arena, if freedom from hereditary taint of disease, if sound vital organs, and exceptional physique, be your good hap; then, fortunate man, learn a few principles of health and exercise, and you will win laurels in this bloodless field with advantage to yourself, and with benefit to your kind.

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### COOKERY: ITS SOCIAL AND HYGIENIC IMPORTANCE.

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From the earliest days of mankind the questions of food and its preparation must necessarily have constituted a subject of constant interest, and it is probable that our remote ancestors, the ancient Britons, though they lived to a great extent on roots and acorns, were particular at any rate as to the succulence of the former and the tenderness of the latter; while the fortunate individual who first hit upon the culinary improvements of baking and

boiling their simple and previously raw food, doubtless received the highest honours which it was in the power of the tribe to award.

As to the present day, it is a well-recognised axiom that "civilized man cannot live without cooks." True, indeed; but the art of cooking is shamefully neglected amongst the modern Britons, giving rise to an incalculable amount of domestic discomfort and waste. The dietary of the average middle-class English family is often monotonous to a degree, and prejudicial to health through the almost slavish adherence to certain articles of food and certain limitations in the ways of cooking them. Sir Henry Thompson, in his book on "Food and Feeding," refers to this fact in strong and truthful language: "Joints of beef and mutton, of which we all know the very shape and changeless odours, follow each other with unvarying precision, six roast to one boiled, and have done so ever since the average middle-class Englishman began to keep house some five-and-twenty years ago." With ample means at his disposal, he gets no change from this wearying round of animal food, of which, proudly impressed with the plainness of his food, he partakes in what is, as a matter of fact, an excessive quantity. Hereditary habit is in a great measure accountable for this failing; but John Bull's spouse must not be held altogether blameless. It often happens that young wives of the middle class are lamentably ignorant of the ordinary rudiments of diet and cookery; and, as a consequence, they, like their parents before them, drift into the easy, if monotonous, way of ordering daily some joint or other for the principal meal to be roast—or rather, baked, for very little meat is cooked now before an open fire—or boiled, six joints prepared for table by one method and a seventh by the other, as Sir Henry Thompson puts it. We could tell here many extraordinary anecdotes of young married ladies' ignorance concerning food and its preparation, but our aim is to effect future improvements, and not to dwell upon past

errors. In one instance a lady, just commencing housekeeping on her own account, having heard her husband say that he was partial to sweetbreads, asked him, when leaving home for the City, to call in at the confectioner's on his way to the station and order half a dozen; on another occasion, a lady, who had treated her husband to legs of mutton daily for a whole fortnight, being mildly reminded by her servant that "Master might like a change of joint," observed, "Oh, perhaps so. Then order a leg of beef when the butcher comes." Mrs. Greenup, one of the examiners at the Kensington School of Cookery, in an interesting article which appeared in our columns some time ago, pointed out that the necessity of teaching girls how to cook is not limited, as many seem to think, to the class from which domestic servants are taken. Those who go into service have some chance of learning household duties; but how about the hundreds of thousands who, up to the time of their marriage, are engaged in various handicrafts giving female employment, or in shops? When they acquire homes of their own, they have not the faintest idea of how to manage them, or how to prepare a meal. Here is an illustrative anecdote:—A prepossessing young shopwoman, who had been for a number of years in the same situation, married a respectable clerk. A lady customer, whom she had frequently attended to in the shop, took a friendly interest in her, and after a little time called to see how she was getting on in her new home. The lady was not less sorry than astonished at hearing the young wife tearfully relate her difficulties. "John," she said, "is very fond of fish, and last evening he brought home a nice codfish. I did not know any other way of cooking it, so I *hung it on the spit and let it roast*. John made a dreadful fuss at dinner time to-day because the fish did not taste right. Oh! how I wish that I had been taught cooking when I was a girl."

Cookery manuals of all sizes and kinds are to be had, of course, but unfortunately the great

majority of these are either too complex in the directions given for preparing various dishes, or the ingredients are beyond the reach of most incomes. The bewildered housewife is told to take a portion of this ingredient, a piece of that, and so on; while, when we come to the concoction of sauces with which the dishes are to be accompanied, it would appal a domestic economist equally with a teetotaler to read the reckless manner in which Burgundy, Madeira, and other vintages are called into requisition.

After all, the best kind of instruction is from object lessons, not from books; practical, not merely theoretical. We, therefore, hail with satisfaction any movements in the right direction, and amongst these a prominent position must be given to the exhibition, which will be held under the auspices of the Universal Cookery and Food Association, at the Portman Rooms, in the first week of May. Those of our readers who have visited previous similar exhibitions organized by this Association need no assurance from us as to their interesting character. The committee of the Association, of which Mr. J. Roberts, of St. James's Hall, is the chairman, and Mr. S. Gorer, 113, Edgware Road, is the honorary secretary, are desirous to make the coming exhibition superior to any of its predecessors; and it is hoped that the outcome of the 1892 exhibition will be the establishment of an institute, in connection with the Association, forming a recognised centre for the various trades associated with it. On the Continent, respective governments make large grants for the maintenance of similar institutions. It is only very recently that the importance of technical education has become recognised, and the teaching of cookery and domestic economy has been left pretty much to individual efforts, instead of being fostered by State subsidies. We have long advocated the fact that if these subjects were regularly taught and duly appreciated, a heavier and more permanent blow would be



dealt to the almost national vice of intemperance than by all the teetotal lectures that were ever delivered. The physique and working power of our population, would, at the same time, show a vast improvement. In short, we should become a healthier, happier, and wealthier race.

W. A.

### IMPROVED LIFE ASSURANCE.

THE principle of life assurance, *i.e.*, of assuring the payment of a defined sum at the death of any given living person, in return for certain periodical payments, termed premiums, cannot lay claim to any great age.

The oldest existing office, the Hand-in-Hand, dates from 1696; and there are but four offices which have been established more than one hundred years, *viz.*, the Union in 1714, the London Assurance and the Royal Exchange, both established in 1720, and the Equitable, dating from 1762. The only other life assurance office started during the last century, and still in existence, is the Pelican, formed in 1797. All the other offices, whether metropolitan or provincial, have sprung up during the present century—the majority of them in its second half. How many have passed away during the past fifty years, realising the epitaph in a country churchyard, engraved on the tombstone of an infant, who lived for a few brief hours:—"Seeing I'm so soon done for, I wonder what I was begun for," it would be impossible to record here. Doubtless, increased habits of thrift, better education, a cheaper press, and similar agencies tended to foster the growing favour with which life assurance was regarded, but, just as the tares will spring up with the wheat, so, beyond contradiction, must it be admitted that many insurance companies were launched without forethought, without proper management, and without adequate capital, merely to disappear as completely and almost as promptly as the ill-fated infant of

whom we have spoken. In 1870 a very useful Bill was passed through Parliament, entitled the Life Assurance Companies Act, which made provision that the sum of £20,000 must be deposited in the Court of Chancery before any mutual life insurance association could be registered. The consequence has been that no other office on the mutual principle has been started in the United Kingdom since that date. Promoters, despite of their proverbial freehandedness, are not necessarily philanthropists, and therefore the mushroom crop suddenly ceased, as no one was prepared to come forward with such a substantial amount as £20,000 for the purpose of providing a guarantee against possible loss. The number of offices formed on the proprietary principle since 1870 has also been small as compared with that of the previous corresponding period.

But something more than a mere relative reduction in the proportion of offices to that of the population is requisite for the improvement of the system of life assurance. One office, and that an old-established one, has gone to work in a very curious manner, by granting policies of assurance in many cases without insisting on a preliminary medical examination; a step which some may regard as formal, but which we—and we certainly do not stand alone in this respect—look upon as a most important safeguard in the interests of the insurance company, in the interests of the policy-holders, and, indeed, in the interests of the person about to be insured. Had a younger office than that to which we refer committed such a departure from the lines of prudence, we think we should have heard a good deal about clap-trap methods of attracting business.

In the matter of life assurance, a subject requiring time and experience for its development, our American cousins have profited considerably by the lessons learned from observation of British institutions, and they have hit upon the weak point of many English offices. Instead of making the charges to insurers

approximative to the risks run, and to the expenses needful for carrying on business, their great aim—their mistake, in fact, from the economic point of view—has been to accumulate reserves until their monetary operations are so immense that such companies might be styled banking, financial, or loan offices. Excessively large reserves are unnecessary. They divert the attention of the management from the objects for which the company was originally established; they sometimes give rise to no small amount of anxiety and complication when, as in several instances, of which we have personal knowledge, hundreds of thousands of pounds have been inextricably involved in un-realizable securities; and, at the best, they mean that more has been taken from the policy-holders than was consistent with reasonable charges based upon sound figures and calculations. In fact, an insurance company conducted upon the old system of accumulating large and ever-increasing reserves, may be regarded in much the same light as a Chancellor of the Exchequer whose main aim is to show a large surplus; the latter overtaxes the ratepayers, and the former overcharges its policy-holders. We shall, perhaps, be reminded that insurance companies having large reserves often give good returns in the shape of bonuses to the policy holders. True! but is it a desirable arrangement for an insured person to pay more than is needful in order that he may get back the difference, or, rather, part of the difference, in deferred payments? If there be one circumstance which operates more than another against the universal adoption of life assurance, it is the fact that so many people find it difficult to keep up the payment of their premiums. Why, then, in the names of consistency and reason, should a system be adhered to which enhances the difficulty without giving any immediate benefit to the insured?

The enormous business transacted by assurance companies in the United States working

on what is designated the “natural premium,” or “cost price,” system is sufficient evidence both of its popularity and of its superiority over the old system of uniform premiums. Hitherto, however, as regards Great Britain, intending assurers have had little option in the matter, for they have had to choose between English offices under the old system and a few branches which American companies have opened in London. But, without unduly disparaging the latter, there are such palpable reasons in favour of home establishments as against those at a distance that the growth of the new system would be very slow, if its introduction were left solely in the hands of American companies; it was, therefore, with much interest we learned, some time ago, that an English company (the British Natural Premium Provident Association, of King Street, Cheapside) had decided to adopt all the best features of the new system, and we have since made a careful study of its details.

The payments made by policy holders are divided into: 1. A moderate entrance fee, which covers the expenses incidental to the admission of new policy-holders, such as agency and medical charges and policy stamps. 2. A uniform percentage on the sum assured, to cover the cost of management. 3. A payment to meet death claims, with a small additional sum towards the contingency fund. The formation of this contingency fund is an evidence of the cautiousness with which the British Natural Premium Provident Association carry on their operations, as its object is to guard against a remote contingency, for excessive mortality beyond that which is provided for by the payments to meet death claims (that is to say, natural-premiums) is unknown in the history of life assurance. The proceeds of this fund and its accumulations from interest are not lost, however, to the policy-holders, as the fund is kept distinct with a view to its division amongst policy-holders on the tontine principle every ten years.



The premiums can be paid either annually or in six two-monthly contributions. Members preferring to make their payments yearly are entitled to interest on unused portions at the rate of 4 per cent. per annum.

By a special trust deed, the security to policy-holders is rendered absolutely safe, and as the new system adopted by this company works out, on close calculation, at little more than one-half of the usual rates under the old system, the British Natural Premium Provident Association has a bright and prosperous future before it. We should have mentioned, when speaking of the security to policy-holders, that the company has a guarantee fund of £10,000, in addition to the deposit of £20,000 in Chancery, made in accordance with the Life Assurance Companies Act.

### PUBLIC HEALTH REPORTS.

*The Annual Report of the Public Analyst for the Parish of St. George, Hanover Square*, is of an interesting and instructive character.

During the twelve months reported on, Mr. Charles E. Cassal, F.I.C., F.C.S., had submitted to him for analysis 396 samples of foods and drugs; nearly all of these—namely, 390—were obtained by Mr. Dyke, the inspector appointed under the Acts, while only six samples (five of milk and one of bread) were submitted by private purchasers under the “Sale of Food and Drugs Act, 1875.” In addition to the foregoing, twenty-five samples of water taken from the Chelsea and Grand Junction Companies’ mains were analysed and reported upon.

We shall have occasion to refer to the water analyses further on. As regards the samples of foods or drugs, they consisted of 155 samples of milk, 55 of butter, 30 of precipitated sulphur, 15 each of bread and olive oil, 12 each of white and black pepper, 10 each of arrowroot, castor sugar, Demerara sugar, coffee, meat extracts or tinned meats, pickles, and vinegar, 8 of confectionery, with a few samples each of cheese,

mustard, seltzer and soda water, and of condensed milk.

Taken in the aggregate, the analysis showed the following percentages of results: Genuine, 71·74; adulterated, 19·43; inferior, 8·33; abnormal, 0·50. This rate of percentage of adulteration is much higher than in any previous year since 1886-87, when it was 20·4 per cent. If this condition of things occurred in the aristocratic parish of St. George, Hanover Square, what must be that existing in poorer parts of the Metropolis?

Of the total number of samples of milk, one in every three was found to be either adulterated or inferior, the depreciation in quality being due either to the addition of water or to the abstraction of fatty matter. Mr. Cassal calls attention to the rapidly growing custom on the part of suppliers of milk to add boracic acid, usually in the form of certain proprietary articles. As a rule, it is added (in solution) in the proportion of seven grains or more of the solid substance to the pint of milk; while in cream this proportion is doubled. Seeing that these “preservatives” are liable to be added both by the farmer in the country and the dairyman in towns, the amount of boracic acid used is more likely to increase than to diminish; particularly as the persons to whom its addition is entrusted are more prone to err on the side of excess than of caution. As the case stands, it is quite possible for an infant taking a quart of milk daily, to swallow as much as 20 to 25 grains of boracic acid. Is the daily ingestion of so large a quantity of this drug consistent with safety to health? It would be difficult for anyone to answer this question otherwise than in the affirmative; and a complete series of experiments conducted by Dr. J. Forster tend to prove that even much smaller doses than those now under consideration are prejudicial to health through the injurious action upon the digestive organs if continued for any lengthened period. Moreover, as Mr. Cassal remarks, the admixture of boracic

acid with milk is not required for the purpose of keeping the latter sound in its transit from the producer to the consumer. The recognised and legitimate method of preservation when necessary is by refrigeration, which adds nothing to the milk; and the employment of preservatives is not only liable to cause injury to health, but is also freely resorted to by dishonest milkmen in order to disguise the fact that milk has become stale and inferior in quality. Boracic acid has also grown much into vogue for keeping butter, and the worst samples of adulterated butter examined by Mr. Cassal, containing from seventy to ninety-five per cent. of foreign fat, were found to contain boracic acid. A sample of condensed milk certified as adulterated had had at least ninety per cent. of the fatty portion removed. Yet it was sold in a tin which bore a label recommending it on account of its excellent quality and its special fitness for young children. Diluted with water, the result would be a weak, sugary solution, specially unfit for food.

There was nothing calling for particular comment in the case of the other adulterations (the two faulty samples of coffee contained, respectively, thirty and twenty per cent. of chicory, the pepper contained a good deal of mineral matter, some decomposition had set in as regards bad samples of pickles, and the vinegar was poor in acetic acid), except as to the precipitated sulphur. This drug should, in accordance with the directions of the British Pharmacopœia, consist entirely of very finely powdered sulphur. But the thievish traders who manufactured the two adulterated samples of precipitated sulphur held different views to those of the compilers of the "B. P.," for the public analyst discovered 39.5 per cent. of foreign matter, chiefly sulphate of lime, in one sample, and 43.8 in the other. We note with satisfaction that in each instance the magistrate before whom the charge was brought inflicted a

penalty of £5, and one guinea for costs. Men who palm off plaster of Paris for a drug of frequent domestic use deserve to be punished when caught.

Unfortunately, magistrates are too much in the habit of siding with the "poor tradesman" against the authorities prosecuting under the Acts for preventing adulteration; but they overlook the fact that there is a still poorer person who stands more in need of protection, namely, the customer who can ill-afford to be fleeced, as well as to incur risk to health. Besides, it is not always the most struggling shop-keeper who is the most dishonest; and the dishonest dealers are generally versed in all kinds of trickery, and ready to avail themselves of every possible loop-hole of escape. In common with other public analysts whose reports have been noticed in *HYGIENE*, Mr. Cassal has come across some curious legal decisions at times. He mentions several in his present report. In one case the magistrate refused to convict, although the sample of milk was certified to contain at least 18 per cent. of added water. The defence set up was that the defendant asserted that the sample had been sold to the inspector by mistake, inasmuch as it was part of a certain quantity put aside for a baker, with whom the dairyman had an agreement to supply him with adulterated milk. Really, there is something very humorous about the magistrate's decision, for no evidence in support of this ingenious defence was forthcoming, while the magistrate could not refrain from the observation that "the case was one of grave suspicion." Moreover, a baker who was so desirous to use adulterated milk would, doubtless, have been quite equal to the addition of any quantity of water that might suit his dishonest practices.

We spoke at the commencement of this notice of the numerous analyses of water made by Mr. Cassal, and, in connection with this circumstance, we may mention that that gentleman rendered excellent service to London,



householders by directing attention at the early part of last year to the disgraceful state of the water then distributed by the Grand Junction Company, which derives its supply from the river Thames. The matter was largely animadverted on in our issues for March and April, 1891. It will be remembered by some of our readers that Mr. Tatton Egerton brought the condition of the water supplied by the Grand Junction Company before the House of Commons. His statements were met with the usual official denials, and the President of the Local Government Board went out of the way to champion the cause of the company, and, doubtless imperfectly instructed by one of the scientific advisers of the Board, thought fit to traverse the particulars contained in the report made by Mr. Cassal. It is almost needless to say that such an expert as Mr. Cassal makes very short work of the arguments advanced in the interests of the water companies.

## Notes and News.

THE SANITARY INSTITUTE have accepted an invitation, given by the Town Council of Portsmouth, to hold their annual Congress and Exhibition in that town, during next autumn.

THE SHOP HOURS' REGULATION ACT, although passed in 1886, does not appear to have been so strictly enforced as it should have been. Under its provisions employers are liable to fine if they employ young persons under eighteen years of age in or about a shop for a longer period than seventy hours, including meal times, in any one week; and it is also made an offence to employ any person under eighteen years of age in or about a shop without keeping exhibited in a conspicuous place a notice referring to the provisions of this Act. According to this Act, the term "shop" includes retail and wholesale shops, markets, stalls, and warehouses where assistants are employed for hire, as also licensed publichouses, and refreshment rooms of every kind. The National Union of Warehouse Assistants (Secretary, Mr. G. W. Patterson, 63, Aldersgate Street, London, E.C.) have issued a circular setting out the foregoing facts.

INSANITARY MODEL DWELLINGS AT BETHNAL GREEN.—A case was heard in the Queen's Bench

Division, on February 13th, showing that when the term "model" is used it is not always to be taken for granted. The plaintiffs (husband and wife), claimed damages from the landlord of some model dwellings, in which they had lived for some time, on the ground that, in consequence of the dwellings being in an insanitary condition, four of their children had died from diphtheria, while the plaintiffs themselves had been ill. The causes of these illnesses were, the plaintiffs alleged, defective drainage and the absence of water for the purpose of flushing, the apparatus being out of order. The defence was that the tenement was in a reasonably fit condition for habitation, and that the system of drainage and the flushing apparatus was in a good sanitary condition when plaintiffs entered upon the tenancy; according to the plaintiffs' evidence, however, there was no water-supply when they commenced tenancy. In addition to the defendant's denial of the plaintiffs' statements, it was urged for the defence that the insanitary condition of the premises which caused the death of the children was due to the uncleanness of the plaintiffs themselves, and to their not allowing the rooms to be sufficiently ventilated. The jury gave a verdict for the plaintiffs, with £77 10s. damages.

PLUMBERS' WORK AND THE PUBLIC HEALTH.—A public meeting of representatives of the counties of Forfar, Fife, and Perth was recently held at the Town Hall, Dundee, in connection with the National Registration of Plumbers. It was stated that a congress of representatives of plumbers and sanitary authorities would be held at Dundee during the current year. The Lord Provost, in moving the adoption of the report on the progress made in the district during the year, referred to the application of grants by the County Councils in aid of the plumbing classes in the three counties. The report included reference to a library of books on sanitation and plumbing established during the year at Dundee. Ex-Bailie Ogilvie, in seconding the adoption of the report, referred to the necessity for statutory powers to give effect to the registration system. Dr. Lennox, medical officer of health, quoted statistics showing the relation between plumbers' work and the bills of mortality and sickness. Besides the master and operative plumbers elected to serve on the district council for the ensuing year, Lord Provost Matthewson was re-elected president, and ex-Provost Ballingall re-elected, and ex-Bailie Ogilvie re-elected vice-president. Mr. J. J. Henderson was re-elected secretary, and Mr. W. Farquharson treasurer.

"WHEN DOCTORS DIFFER, WHO SHALL DECIDE?" is an off-quoted proverb. Not long since, two medical men happening to show some divergence of opinion at a dinner-party, a barrister who was present chimed in with this quotation; upon which one of the disputants observed, "It is a way we have got into lately; we have both been witnesses in cases at the Law Courts lately, and I suppose we have caught the habit from counsel."

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## THE AIR AND WATER OF LONDON: ARE THEY DETERIORATING? \*

By LOUIS C. PARKES, M.D., D.P.H. Lond.  
Univ., Lecturer on Public Health at St.  
George's Hospital, Medical Officer of  
Health and Public Analyst for Chelsea.

FROM time to time, to those who are of a reflective turn of mind, and more especially to Medical Officers of Health who are so intimately acquainted with Public Health questions, the question suggests itself—is London a better place to live in, as regards health and comfort, than it was half a century or so ago? Those who are acquainted with the past and present conditions of life of the mass of the population, would answer largely in the affirmative, but nevertheless with certain reservations. There can be no question that the majority of the population is far better housed now than at any previous time in the history of London. Slums and rookeries have to a considerable extent disappeared; improved houses, and working-class dwellings of substantial character have been erected; streets have been widened; open spaces have been secured; and all classes have benefited enormously by the growth of practical sanitary knowledge in drainage, house sanitary arrangements, and sewerage.

A public health service, on the whole of a very efficient kind, has grown up in London, and sanitation is now enforced in a way which fifty years ago would have appeared almost incredible.

Vast improvements, then, have been effected; and we see the results of the improvements in a lowered general death-rate, and in a greatly diminished mortality from small-pox, scarlet fever, typhus, typhoid fever, and diarrhoea—diseases of the zymotic class usually said to be preventable. For instance, during the five years, 1886-90, the death-rate from small-pox in London was only one per million, as against 402 per million in 1841-50; during the ten years, 1881-90, the death-rate from scarlet fever was 333 per million, as against 1,133 per million in 1861-70; during the same decennium the death-rate from fever (typhus, enteric, and continued fever) was 205 per million, as against 979 per million in 1841-50; and the death-rate from diarrhoea in 1881-90 was 749 per million, as against 1,030 per million in 1851-60. Virulent cholera has been practically extinguished during the past twenty years in London and in the country generally.

It is true that sanitary improvements have had little or no effect in lowering the mortality from measles and whooping cough—these being diseases of early childhood, over which it is extremely difficult to exercise any effectual public control. It is also true that diphtheria

\* A Lecture delivered at the Sanitary Institute, March 9th, 1892.



has shown a notable increase, and caused a heavy mortality in London during the past ten years, the death-rate for 1881-90 being 259 per million, as against only 122 per million in the preceding decennium, but this is no doubt the price we have to pay for our system of compulsory elementary education, which causes the aggregation of such large numbers of children in confined spaces.

During the past two years, also, influenza has been with us, and has raised the death-rate by some 2,000 per million during its visitations. We can at present only plead want of knowledge of how to exercise control over this disease in its epidemic form. It is certain that the ordinary methods of notification, isolation, and disinfection are—even if they were put in force—powerless to arrest the spread of the epidemic. They have not been put in force up to the present, however; and we are obliged to be content with a policy of inactivity, whilst we watch the ravages of a communicable malady, a policy which furnishes a curious commentary on the limitations of human knowledge at the end of the nineteenth century.

With all its modern sanitary improvements, however, one, if not two, of the most vital factors of life in London, is undergoing steady, continuous degeneration. I allude to the air of London, and in a less degree to the water of London.

The degeneration of the air is due to the continuous growth of the town, which year by year removes the centre of the city further and further away from the country, and to the steady increase of smoke from coal fires poured into the atmosphere. It is a curious and interesting fact that London is dependent, one might say, almost for its life, upon the winds which bring pure air to it from the country. It is very seldom that the atmosphere in this climate is positively stagnant. Up aloft, above the chimney pots, there is usually, even on the calmest days, a just perceptible current, which serves to carry away the smoke and vitiated

air, and brings fresh air in its place. When, however, during anticyclonic conditions, the atmosphere is positively stagnant, London, in winter, creates an atmosphere which is positively irrespirable. I need hardly remind you of the week's fog just before Christmas last, nor describe in detail what you all probably experienced.

Nor is this fog to be wondered at when we consider that there are some 800,000 houses in London, each with half a dozen or more chimneys in communication with an open fire-place; that some 7,000,000 tons of coal are burnt annually in the metropolis, or some 20,000 tons a day—on a cold winter's day as much as 40,000 tons is said to be consumed—of which daily quantity 200 tons will escape into the air as fine carbon or soot, with probably an equal amount of sulphur as sulphurous acid. There will also be produced about 60,000 tons of carbonic acid to help to vitiate the air. The latter, being a gas, would escape easily and diffuse with the fresh air were it not for the suspended sooty particles in the fog; and thus it is easy to understand that the air of a yellow London fog may contain 12 or 14 volumes of this gas in 10,000 parts, as against the normal 4 per 10,000. The evil is bad enough, but it is increasing. Every year some 15,000 or 16,000 new houses are added to London's huge bulk, each burning its due proportion of coal, and the number of foggy days in the year is gradually increasing.

The mortality and illness produced by a dense yellow fog in London are not difficult to demonstrate. For instance, the death-rate of London for the fortnight ending December 19th, 1891, when ordinary atmospheric conditions prevailed, was only 18 per 1,000. The great fog commenced on the 20th, and lasted until night time on the 25th. The death-rate of London for the fortnight ending January 2nd, 1892, was 32 per 1,000, or 14 per 1,000 in excess of the previous fortnight, and the aggregate mortality from diseases of the respiratory organs in the fort-

night exceeded the corrected average by 829. As a matter of fact, the excessive death-rate was very largely due to lung diseases brought on or aggravated by the condition of the atmosphere in Christmas week. Little, if any, part of this heavy mortality can be attributed to influenza, as this disease did not become widely epidemic in London until after the first week in January; but the subsequent high death-rates in London, which then prevailed until the middle of February, are no doubt chiefly due to influenza mortality; although it may well be that the Christmas-week fog prepared the way, so to speak, for the influenza, and weakened the defences of the body at the very time when it was most important that they should be at their strongest. At any rate, the epidemic through which London has passed has been far and away more fatal in its effects than either of its predecessors.

Fogs, however, are but exaggerated types of what London air is during all the winter months. They concentrate public attention for a time, but are soon forgotten, like all other experiences which are painful to remember. The smoke, normally present in winter in our atmosphere, cuts off a good deal of light, as witness the "duration of sunshine" records in London and in the country outside of London. Ozone is practically absent from the air of London, and the carbonic acid, even of the most open spaces, is usually about 0.5 per 10,000 parts in excess of that in country air. It is difficult to say what exactly are the effects of the deteriorated atmosphere on the health of Londoners; but I think it may safely be assumed that much of the anæmia, which is so characteristic of London citizens—the pale faces and disordered digestions—and many of the wasting diseases of children, more especially rickets and scrofula, are to no small extent due to a condition of atmosphere which prevents the perfect action of the lungs and the complete oxygenation of the blood, and so lowers the tone of the body and the ability to repel the invasion

of disease. There is also the irritant effect of the dust and soot particles breathed into the lungs and deposited in the bronchial glands. These foreign particles are not obviously injurious to the majority of people, but they may affect some. In any case they do no good.

We must next consider what remedy, if any, there is for this evil, affecting, as it does, a population of four and a half millions people, and increasing, as it does, in magnitude year by year. Many people are inclined to look on London fogs as natural phenomena inherent to London's site and climate, and therefore incapable of remedy. But this is a grand mistake. White mists are, no doubt, inseparable concomitants, under certain atmospheric conditions, of low lying positions on tidal rivers not far away from the sea; but yellow fogs are the products of coal combustion mixed up with nature's white mists, the latter being of a comparatively harmless kind, and limited more or less to night-time, as they are rapidly dispersed by the sun's rays.

It is now generally acknowledged that at least 95 per cent. of the smoke in London issues from the chimneys of dwelling-houses, the other 5 per cent. being "manufacturing" smoke. Consequently any attempt to deal with the smoke nuisance must aim at controlling the methods of combustion adopted by the householder. The manufacturer is already within the law; but the chimneys of private dwelling-houses may pour out as much black smoke as they can, with impunity. I am not an expert in this matter, and I have brought this subject forward more with the view of giving an opportunity to those Members, Fellows, or Associates of the Sanitary Institute, who are well and practically acquainted with methods of heating and of smoke prevention to express their opinions than to air my own views. After the discussion it may be possible to formulate some resolution which will carry the sense of the meeting, and will show the public the lines upon which The Sanitary Institute is of opinion that the question of



smoke abatement in London should be approached.

I will, however, propound the following as being questions to be discussed, and, if possible, decided one way or another.

(1) Is it reasonable to hope that the voluntary adoption in old houses, or the compulsory enforcement in new houses of smoke-preventing stoves designed to burn ordinary domestic house-coal, will visibly and satisfactorily abate the smoke nuisance in the metropolis?

(2) Can the use of anthracite or other smokeless coal be made compulsory throughout London, to the exclusion of the ordinary house coal, having regard to the fact that such coal is not well suited to burn in ordinary domestic open fire-places, and that the present output is said to be at present only some 4,000 tons a day—London alone requiring on an average at least 20,000 tons a day?

(3) Is it possible to adopt, and render acceptable to the bulk of the ratepayers, a system (municipal or by private enterprise) of heating houses by steam or hot-water pipes?

(4) Is the remedy to be looked for in the municipalisation of the London gas undertakings, with the production of a cheap gas at 1s. or 1s. 6d. per 1,000 cubic feet? For at this figure gas could be used for heating purposes as cheaply as coal at 20s. per ton, equal heating effects being produced in dwelling-rooms by open gas fires of good design, as by coal fires.

With reference to this latter question, subsidiary questions arise as to whether (*a*) it will be necessary to supply a gas free from illuminants, to be used for heating and cooking purposes only; and (*b*) to manufacture the gas in the colliery districts at the pit's mouth, and supply it to London through enormous mains under graduated pressure; in order that the price may be so low as to allow gas to compete successfully against coal.

I have said nothing as to the adoption of systems of slow combustion close stoves in houses, heated by coke or smokeless coal, as it

appears to me that our climate, our habits, and our customs do not admit of, and indeed are strongly opposed to, the system which answers, however, well enough in countries with very cold and prolonged winters, when the chills and draughts produced by open ventilating fire-places would be intolerable. It seems as if no system of heating could be adopted in this country which does not preserve, more or less intact, the open hearth, the cheerful blaze or glow of incandescent particles, and the escape of a large quantity of heated air up a flue, constituting the ventilation.

All this is very much against any general adoption of hot water or steam heating in ordinary dwelling-houses; and as far as my own experience goes, smoke preventing stoves are only smoke preventing when properly managed, disobedience to instructions, or carelessness, usually meaning a production of smoke in considerable quantity. The choice seems therefore to lie between the compulsory use of smokeless coal; or the taking of such steps by the citizens, as a whole, as will secure the enormous cheapening of coal gas, and then by placing a tax on all kinds of coal grates, or even upon smoke-producing coal itself, to render it more economical for everybody to burn coal gas as a fuel.

It is true that coal gas produces, for equal heating effect, as much carbonic and sulphurous acids as coal does, but the absence of the suspended carbon soot particles makes all the difference as regards yellow fog. Without the suspended sooty particles in the air to form a nucleus for the moisture, the gaseous products of combustion will be enabled to escape into and diffuse with enormous masses of fresh air, and the dark, black, acrid, suffocating, choking atmosphere, which constitutes the modern London fog, will become a thing of the past. This sounds, perhaps, very optimistic and improbable, but *it is* feasible to restore purity to the London air, if we only set about it the right way. That the results of abolishing

smoke would be remunerative, and well worth the vast outlay needed in the first instance, is a statement the truth of which I am firmly convinced of.

As regards the water supply of London, I am afraid we are working within a vicious circle, as we are doing with our air. Year by year London increases in size and population. Year by year the towns and villages, and London suburbs in the Thames and Lea valleys, are increasing as rapidly. The water drawn from the Thames and Lea has consequently to supply an ever-increasing population, and the limits will before long be reached, when the resources of the rivers as reservoirs of water will be stretched to their uttermost.

As the villages and towns on the upper reaches of the rivers and their tributaries increase in size, there is a constantly increased tendency for larger quantities of the waste refuse of these communities to find their way into the streams and rivers which are the natural drainage beds of the localities. This tendency to increase in pollution can only be kept in check by the watchfulness and devotion to duty of river conservators, and by increased effort on the part of the water companies in the filtration and purification of the water they supply.

One of the special drawbacks of the Thames and Lea water companies is the compulsion they are under to take in water from the river when it is in flood, owing to the insufficient capacity of their storage reservoirs. The turbid and foul water from the river in flood is most difficult to filter effectually, with the result that a coloured, turbid water, containing an undue amount of organic matter, is supplied to the consumers in London at such times. This happened notably last autumn, when, owing to the continuous heavy rains, the Thames was in flood for a very long period, and the water supplied by a great majority of the Thames water companies to London was distinctly much inferior to the average quality. Who can say how much illness

and loss of health was attributable to this wholesale depreciation in quality of our water supply?

It will not be amiss to turn to the Reports of the Official Water Examiner to see for ourselves what was the quality of the water supplied to London in 1891.

"At the end of January," writes the Water Examiner, "a practical illustration occurred of the incapacity of the existing works for dealing with the excessively turbid water which the Thames occasionally affords. The breaking up of the prolonged frost, and the rainfall of the 29th January, produced a flood in the river of exceptionally muddy and polluted water. The filters having already suffered in condition from the great difficulty experienced in cleaning them when covered with ice, were overtaxed by the turbid water which was unavoidably admitted, and the supply delivered into London on the 30th January, and for some succeeding days, was much discoloured." Dr. Frankland reported in February that the water abstracted by the Thames companies was, in all cases, of very inferior quality, being polluted by an abnormal amount of vegetable organic matter. That of the Grand Junction Company, supplied to over half a million of people, on the 5th February surpassed, in respect of organic impurity, any sample of Thames water examined during the past twenty-five years. It was opalescent from imperfect filtration, and was not in a fit state for dietetic use.

After a time the water appears to have regained its average standard of purity, but in September we find it again reported that the water abstracted from the Thames suffered considerable deterioration in consequence of the flooded state of the river. The supply of the Chelsea Company was least affected, this company having the largest storage capacity for unfiltered water, viz., 14·1 days' supply, or more than double most of the other Thames companies.

In October we find that the water abstracted



from the Thames by all the companies, except the Chelsea, was very seriously affected by heavy floods. It was brownish in colour, and the organic matter in solution, although chiefly of vegetable origin, had been increased in amount to a very objectionable extent. "It is evident," writes Dr. Frankland, "that these companies, with their present limited storage, are unable to avoid the delivery of polluted flood water."

In November, the Thames water supply had generally improved, but it is now the turn of the Chelsea Company to fail; and the water supplied by this company, which was far the best in October, was the worst in November, and contained 73 per cent. more organic matter than that supplied by the Lambeth Company on the same day.

In December the Chelsea supply had improved, but that of the other Thames companies had again fallen back, the excessive floods in the Thames Valley continuing and rendering it "most difficult for the companies, who have but small storage at their command, to send out water fit for dietetic use." The water of the Southwark Company was, indeed, opalescent from finely suspended clay, which was not removed by subsidence or filtration.

From the above quotations it will be seen that during five months of the year 1891, the water supplied to London from the Thames was for the most part of inferior quality, and on several occasions for days together not fit for dietetic use, that is to say, *not safe to drink*. The river Lea is also liable to flooding, and the water abstracted from its lower reaches by the East London Company exhibited fluctuations in quality similar to those affecting the Thames. The only water supplies to the metropolis that maintain a good standard of purity throughout the year are those of the New River Company from the upper reaches of the Lea, which are comparatively unaffected by floods, and the deep well-waters of the Kent, Colne Valley,

and East London Companies, the latter being invariably described as of excellent quality.

Of course it is open to anyone to say, that the year 1891 was an exceptionally bad one for the water companies owing to the severity of the frost in the early part of the year, and the tremendous rainfall in the latter part of the year. This may be granted, but still I think we shall all agree that the water supply of London, with its 4½ millions of inhabitants, ought to be independent of exceptional circumstances of all sorts. As a matter of public health, it is not a wise policy, and it is certainly not a scientific proceeding, to take in grossly polluted waters, such as the Thames or Lea in floods are, and then endeavour to render them potable by storage and filtration through sand and gravel. The endeavour is not always a successful one, as I have shown from official reports, and surely at the end of the nineteenth century the citizens of the wealthiest city in the world have a right to ask that the water supplied to them for domestic purposes shall be, like Caesar's wife, above suspicion.

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### THE MEDICAL SUPERVISION OF THE MERCANTILE MARINE.

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By J. STOFFORD TAYLOR, M.D., Medical Officer of Health for the City and Port of Liverpool.

THE object of this paper is to point out the want of system in the medical supervision of the mercantile marine as it exists in Liverpool.

In an old country where regulations have been made to meet the requirements of a growing population, and an extending commerce, some of them will become obsolete, and others, if they do not conflict, will certainly not work harmoniously; it is with a view to consolidate these regulations that this paper has been prepared.

The inspection of emigrants, and the sanitary arrangement of emigrant ships, are conducted by medical men appointed by and acting under the Board of Trade. The visitation of ships

having infectious diseases on board is made by a medical officer of the Customs, who has power to place any infected ship (except cholera ships) in quarantine; but, by a recent order of the Customs, he is directed to inform the port sanitary authority of any case of small-pox, fever, scarlatina, measles, etc., on board ship, and to quarantine vessels only when infected with plague or yellow fever. If, however, any vessel is placed in quarantine, the Customs have no means of dealing with it in the port of Liverpool, as was evidenced some years ago, when a large steamer was kept in quarantine for five days, and then had to be passed over to the port sanitary authority to be dealt with.

The proceedings of the Board of Trade doctors and of the Customs' quarantine doctor, are opposed to the satisfactory working of the port sanitary authority, and are altogether unnecessary; for section 110 of the Public Health Act, 1875, as amended by the Public Health (Ships) Act, 1885, gives power to the port authority to deal with infectious disease and nuisances on board a ship as if it were a house, and the master the chief occupier or tenant. The Medical Officer of the port sanitary authority has no power to place a ship in quarantine for plague or yellow fever, but he has power to detain a ship, under an order of the Local Government Board, if infected with cholera, until he has examined the passengers and crew, and made arrangements for the removal of the sick if possible. Passengers not suffering from sickness are allowed to land, and the vessel is then thoroughly disinfected and cleansed.

During the prevalence of cholera in Marseilles, in 1884, several vessels infected with cholera arrived in the Mersey from that port, and were treated according to the regulations without any extension of the disease to the crew, passengers, or inhabitants of the port.

In conclusion, it is suggested that all medical and sanitary matters appertaining to ships should be under the control of the port sani-

tary authority, that medical inspectors of emigrants and emigration ships should be officers of the port sanitary authority, that the ship doctors should report to the port sanitary authority all cases of sickness occurring during the outward and homeward voyages, and that the Quarantine Act be repealed; if it be thought necessary to retain any of its powers, let them be transferred to the Local Government Board, who could then make regulations for the management of ships infected with plague or yellow fever, similar to those made for cholera.

### EPIDEMICS IN SCHOOLS.\*

By C. E. SHELLY, M.A., M.D., Cantab., Consulting Medical Officer to Haileybury College, etc.

THE connection between schools and epidemic disease presents at least three important aspects. A school is peculiarly liable to the incidence and extension of such maladies; it presents special opportunities for their investigation, and epidemic illness is particularly important to both the school authorities and to the parents of the pupils, because of its interference with the health and education of the latter.

Schools are peculiarly susceptible to any epidemic influences, because they are closely aggregated populations of young people of whom an unusually large proportion (as compared with an equal number of the general population) is unshielded by the protection commonly afforded by a previous attack of the malady in question. The child at school is not, as an individual, more susceptible than the same child at home, but while at home it exists as one unit of the general population, the susceptibility of which is greatly diluted by the intercalation of numerous other persons, of all ages, whose personal intimacy is much less close, and most of whom, being already protected by a previous

\* Abridged from a paper read before the International Congress of Hygiene.



attack, are not readily transformed into personal foci of infection. In the school itself, however, these conditions are reversed—the susceptible material is concentrated and in relative excess, it is peculiarly liable to attack, and infection, howsoever originated, has a field specially favourable to its incidence and its extension.

The evolution of a specific type of disease from ancestral germs originally indifferent is not impossible, but the theory is as yet unproved. And, if its probability be admitted, we have no evidence to warrant us in applying it more to schools than to other collections of humanity, and least of all, if (as should always be the case) the school and the school-life be healthy. Other and reasonable explanations are abundantly to hand. And if the premises, the administration, and the daily economy of the school are in accordance with hygienic rules, it is quite justifiable, in the present state of our knowledge, to assert that whenever epidemic illness arises in a school it has always been imported. Indeed, the avenues of infection from without are so many and so varied that it is humanly impossible to safeguard every one of them.

From the nature of the case special facilities exist for this importation of disease; thus:—

1. While at home, the child is brought into contact with the outer world of “all sorts and conditions” of men, women, and children, much more frequently and more intimately than is the case while it lives at school. Day scholars spend from four-fifths to three-fourths of their lives away from school, *i.e.*, frequently exposed to the risk of infection. And the pupil at a boarding-school similarly spends at least three months out of every twelve in holidays and exeat.

2. But while at school—even as a boarder in an establishment constituting a relatively isolated community in a sparsely populated country district—there are still many points of connexion with the world outside: letters, parcels,

clothing, “hampers;” the visits of tradespeople, and to shops, etc.; communication with servants; and, at the beginning of each term, an intimate association with the numerous other pupils—each, perhaps, a freshly-arrived representative of another family elsewhere—with all its possibilities of contracting and transmitting infection; besides the possibility of inhaling or imbibing infected air or water in the neighbourhood of the school, for the best school cannot control its neighbours, or absolutely secure its pupils against the results of other folks’ defective sanitation.

3. By far the most potent influence, however, so far as regards the commoner epidemic ailments at all events, is that dependent on the fact that so large a proportion of young school children is unprotected by any previous attack of the infectious diseases to which they are from time to time exposed during subsequent years. This is due, in the first place, to the circumstance that, during the earlier years of life (infancy, early childhood), the individual’s world is practically its home; it mixes, in fact, less in society than it does when older; its points of common contact with the world at large are fewer; and it is subjected to greater personal care and supervision, the result of all these influences being a relatively effective protection from the risks of infection. It might be theoretically anticipated that this parental guardianship would be effective in proportion to the spread of hygienic knowledge amongst the population generally; and this theoretical assumption is corroborated by the results of somewhat extended observations. A large number of public and other boarding-schools have furnished data on this head derived from an analysis of the facts which are recorded on the health certificate, which is filled up by the parents or guardians of each pupil at the time of his entrance into the school. Subjoined is a Table (A), compiled from the statistics of one such school which has been selected, not because its results are the most striking, but

because its carefully kept records extend back over a longer interval of time than do those of any other school with which I am acquainted.

TABLE A.

| Statistics for                              | I.<br>Sixteen years,<br>1863-79. | II.<br>Eight years,<br>1879-87. | III.<br>Twenty-four years,<br>1863-87. |
|---------------------------------------------|----------------------------------|---------------------------------|----------------------------------------|
|                                             |                                  |                                 |                                        |
| Boys entered ...                            | 1,639                            | 959                             | 2,598                                  |
| <i>Unprotected by a previous attack of—</i> | 1863-79.                         | 1879-87.                        | 1863-87.                               |
| Varicella ...                               | 1,624 or 99.08 %                 | 955 or 99.5 %                   | 2,579 or 99.2 %                        |
| Scarlatina ...                              | 1,183 or 72.18 "                 | 718 or 74.86 "                  | 1,901 or 73.57 "                       |
| Rubeola ...                                 | 382 or 23.3 "                    | 243 or 25.5 "                   | 665 or 25.79 "                         |
| Pertussis ...                               | 418 or 27.3 "                    | 285 or 29.7 "                   | 733 or 28.02 "                         |

These statistics cover the period 1863-87. If the 24 years be divided into three equal periods of eight years each, but little difference is observable between the first and second of these epochs. And the combined returns for the first sixteen years, 1863 to 1879, are therefore grouped together in column I. It will be at once noticed that this column contrasts with that for the last period of eight years, 1879 to 1887, in the decided increase of the *unprotected* which is observable in the latter period. Had this been confined to such a disease as measles it might have been explained on the supposition of the more general and more careful differentiation between this malady and Rôtheln ("German measles"), which has obtained among both the medical profession and the

public during recent years. But this increase of the *unprotected* obtains in the case of each of the maladies enumerated, and one is compelled to the conclusion that it is really due to an increasing education of the public in general hygiene;—an increasing education,—because the returns from this and other large schools for the last four years (*i.e.*, since 1887) give evidence of a still further slight and continuous rise in the proportion of the *unprotected*. In other words, owing to more careful prophylaxis at home, and to the earlier recognition of, as well as to the prompter and more efficient isolation of, "first cases,"—a larger (and an increasing) proportion of school children escape the incidence of epidemic illness during infancy and early childhood; *i.e.*, in the pre-school age fewer contract these maladies than was formerly the case; and a great number, therefore, enter school *unprotected*.

To the medical officer of health and to the family doctor such a result may be a legitimate cause of satisfaction; but it does not lessen the responsibilities of the masters or of the medical officers of schools; and it cannot be regarded as tending to reduce the minimum of hospital accommodation required by a school. This progressive increase in the proportion of the *unprotected* at the beginning of school-life has obtruded itself upon my notice in several other ways, in the course of investigating this and kindred questions. Thus, for example, in a large preparatory school (350) to which only *young* boys are admitted, the entrance age was, some years since, raised by 12 months; but the average ratio of the *unprotected* (from measles, for example) now stands practically at the same figure as formerly; and this, despite the fact that 12 months of age, more or less, makes a very notable difference in the returns for any yearly period between the ages of 9 and 12.

As might well be supposed, results such as those which have just been considered, are most notable in the higher strata of society—amongst that section of the community which,



in addition to natural intelligence and education, is in a position to command physical, moral, and sanitary advantages which are often beyond the reach of their more ignorant and less prosperous neighbours. The returns from schools of markedly different social status present, in this respect, most striking and instructive variations. Moreover, it is almost self-evident, and is clearly shown by returns, that the child's liability to infection will tend to decrease with its advancing age, in proportion, in fact, as one epidemic malady after another attacks it and confers its own quantum of immunity.

4. Day schools present conditions even more favourable to the incidence of epidemic infection than does ordinary home-life; for, at such a school, each child has specially frequent opportunities of association with a number of other children, and each of these latter is exposed to specially frequent and diverse risks of infection. Hence, the day school is much more open to attack than is the boarding-school. But comparing day and boarding-schools for children *of the same age*, outbreaks of epidemic illness will, indeed, be more frequent in the former; but each epidemic is apt to be relatively less extensive; because, in the day school, owing to the very frequency of recurrent epidemics, a relatively smaller number of pupils are, at any given time, unprotected by a previous attack of the disease in question; conflagrations, as it were, occur with frequency, but they are comparatively limited in extent, because so much of the town is always already "burnt out."

5. For reasons similar to those considered above, the attendance of day scholars at a boarding school greatly increases the number of avenues by which infection may be introduced. In other words, the frequency of epidemic outbreaks is increased, while their relative extent is thereby proportionately diminished.

6. The boarding school proper is the most

isolated community of this class. By the exercise of due precautions epidemics may for long be kept at bay. But during this period of freedom from such forms of illness, the proportion of unprotected pupils in the school is rising; and when, at last, infection is introduced—as, sooner or later it is bound to be—there is a large amount of susceptible material open to its influence, and comparatively few barriers (as represented by already protected individuals) to delay or stay its progress. Epidemics, in short, are relatively infrequent, and consequently more extensive when they do occur.

In all respects, then, the more isolated and self-contained community—the boarding school—affords a typical field for the study of epidemics in schools; and it is to this class of school, and more particularly to boarding schools for boys, that the following remarks will especially apply.

The establishment and the spread of an epidemic are favoured mainly by two conditions—which are of practical importance because, given certain simple data which ought to be easily obtainable in the case of every boarding school, it is possible (for some diseases at all events) to calculate their value and to forecast their effect with a reasonable approximation to substantially accurate results.

These two conditions are :—

*First.*—The close aggregation of susceptible material, as represented by pupils who are unprotected by a previous attack of the particular epidemic disease under consideration. The amount of susceptible material which is present in any given case is proportionate, mainly, to the *age* of the scholars; *i.e.*, practically, to the number who are or are not already protected by a previous attack. It is generally recognised that, for most of the commoner epidemic illness—measles, scarlatina, whooping-cough, Röteln, mumps, and chicken-pox, for instance—one attack confers on the sufferer a very considerable degree of immunity

against a recurrence of the same malady. It would not be unreasonable to surmise that *some* degree of immunity (more or less complete, and lasting for a longer or shorter time in different cases) is conferred by an attack of *any form* of infectious disease. The modern theories of the ætiology and pathology of this class of disease are in accord with such a surmise; and experience is also in its favour, for the apparent exceptions are only relatively exceptional. An attack of diphtheria, for example, does not protect the sufferer from a second or third experience of that disease to anything like the same extent that obtains in the case of scarlatina or of measles. But a close examination of the two cases reveals the fact that the difference is one of time rather than of degree. For it is extremely rare to find an individual suffering from a second attack of diphtheria soon—or, indeed, for some time—after recovering from a first attack, even though throughout his illness, and subsequently, he remains exposed to precisely the same conditions as those which surrounded him for some time before its commencement. The modifying influence exerted upon the life-processes of the patient may be, so far as is known, equally profound in the two cases; but this effect is usually much more lasting in the one disease than in the other. Reduced in health though he may be, the convalescent from a common cold, even, seldom contracts another immediately, in spite of his continuing to live on terms of the closest personal intimacy with the other suffering members of the household through which “the cold is running.” On the other hand, we meet, every now and again, with individuals on whom a severe attack of scarlatina or of small-pox confers but a slight or short-lived protection against a repetition of their illness. It may be concluded, then, that *all* infectious and epidemic diseases are (for different periods) self-protecting; and we may regard an attack of any such disease as a natural form of prophylactic inoculation, affording a

protection whose duration varies, between wide limits indeed, for the several maladies included in this large class.

For the present, however, we are concerned with those common maladies, a first attack of which is generally acknowledged to afford immunity, usually both absolute and prolonged against a second. And, during the earlier years of life, this immunity stands in an inverse ratio to the *age* of the individual, because, with increasing age come increased opportunities of infection, with a resulting increase in the amount of protection thereby ultimately conferred.

The other cause which, in conjunction with the influence exerted by the average age of the pupils, favours the outbreak and spread of the epidemic, depends on—

*Second.*—The existence of certain proportions between the number of unprotected—and, consequently, susceptible—pupils, and the *total* number of pupils in the school. This particular proportion may be termed “the explosive ratio,” and its precise form varies with the particular epidemic disease which it represents. Both the risk and the probable extent of a conflagration in a building vary with the amount of its combustible contents, and with the extent to which this is diluted, by intimate admixture, with non-inflammable material. If a number of cartridges, some loaded and some empty, were jumbled together in a box, not stored in a magazine, but exposed to the incidence of any casual spark, the probability of an explosion would have an intimate relation to the proportion existing between the number of loaded cartridges and that of the harmless empty ones that have been already fired. This simile fairly represents the conditions obtaining in the average school and its liability to outbreaks of epidemic disease. For, just as the empty cartridge cases, though not themselves explosible, might smoulder and thus lead to the ignition of their loaded fellows, so a child



already protected by a previous attack of the disease, though unlikely to again fall ill with it himself, might convey its infection—by means of his person or his clothing—from one patient to some other still susceptible school-fellow. And, moreover, just as it might be of service to know at any given time the proportion existing between the loaded and the empty cartridges, in order to estimate the probability and the force of an explosion, so it is, in many cases, both possible and serviceable to be able to forecast the probable date and extent of inevitably recurrent epidemics, if we can but ascertain the ratio which exists between the number of the already protected and of the still susceptible pupils in a school.

*(To be continued.)*

## THE FACTORY AND WORKSHOP ACTS.

THE duties of medical officers of health and other officials engaged in sanitary work are far more voluminous than is commonly supposed to be the case. In exemplification of this fact, we may mention the special reports made by the Medical Officer of Health for Bristol (Dr. D. S. Davies) and the Borough Engineer (Mr. F. I. Ashmead, M.I.C.E.), on the Factory and Workshop Acts, 1878-1891, and other allied Acts, recently submitted to the Sanitary Committee. Dr. Davies commences with various clear definitions of expressions used in the Factory and Workshop Acts, and gives next an abstract of the sanitary provisions contained in the last Act dealing with factories and workshops (54 and 55 Vict., cap. 75), passed in August, 1891. The summary of the powers and duties, under this Act, of an urban sanitary authority out of London is so well drawn up and so concise that we reproduce it *in extenso*, merely omitting the sectional references.

1. The sanitary authority may cause proper closet accommodation to be provided for workshops or manufactories, and for both sexes.

2. The control of workshops is taken from the factory inspector and given to the sanitary authority. Workshops include "adult male" workshops for these purposes. 3. It is the duty of the sanitary authority to take action in case of, and secure abatement of, all effluvia and closet nuisances in workshops. 4. It is the duty of the sanitary authority to secure lime-washing in cases where the medical officer of health or inspector of nuisances certifies it to be necessary. 5. It is the duty of the sanitary authority to cause systematic inspection to be made. 6. It is the duty of the sanitary authority to secure proper ventilation, and to prevent overcrowding of workshops. 7. If they neglect either of the duties referred to in 3, 4, or 6, the Secretary of State may direct the factory inspector to inspect workshops, take the required proceedings, and recover expenses from the sanitary authority. 8. In case of offences or sanitary defects coming within the Public Health Act, 1875, in factories or workshops, the inspector of factories shall give notice to the sanitary authority, who shall take the necessary proceedings; and if they do not do so within a reasonable time, the inspector of factories may take action, and recover expenses from the sanitary authority. 9. The sanitary authority has power to secure a proper supply of water in all workshops.

If properly and systematically applied, the foregoing provisions of the Act cannot fail to add greatly both to the comfort and health of the people employed.

The amount of additional work thrown on the sanitary officials in Bristol, as in many other populous places, may be gathered from the circumstance that Dr. Davies mentions that the list of workshops in the Bristol district, drawn up by Mr. W. H. Johnstone, H.M. Inspector of Factories, comprises 1,700 which are now transferred under the 1891 Act to the control of the urban sanitary authority. In addition to these there are a large number of "adult-male" workshops in which no children, young

persons, or women are employed; these are not included in Mr. Johnstone's list, but they require control, thus raising the total number to 3,000, or more. To meet the increased work, Dr. Davies recommends the immediate appointment of one sanitary inspector and other appointments subsequently, should they be found requisite.

Mr. Ashmead, the borough engineer for Bristol, deals specially with that portion of the Factory and Workshop Act, 1891, which provides that it is the duty of the sanitary authority of a district to examine every factory in which more than forty persons are employed, if its construction is commenced after January 1st, 1892. He advises that the sanitary authority should not, in the case of new factories, give any certificate on the deposit of plans, and that any sanction they may give to plans presented to them, should be subject to compliance with the bye-laws only. A recent return shows that in Bristol there are from 600 to 700 factories which were either constructed or commenced before January 1st, 1892, one-half of which came under the scope of the Act, as employing more than forty persons, some or all of whom work in a story or stories above the ground-floor. Section 7 of the Act under consideration requires a certificate to be obtained from the sanitary authority that all the stories above the ground-floor are provided with efficient means of escape in case of fire.

### DEFECTIVE PERSONAL HYGIENE AS IT AFFECTS THE TEETH, IN INFANCY, CHILDHOOD, AND SCHOOL LIFE.

BY GEORGE CUNNINGHAM, M.A. (Cantab.),  
D.M.D. (Harvard), L.D.S., England.

(Continued from page 76.)

EVEN if the tooth-brush is applied in the most thorough manner, it is difficult to prevent the lodgment of fermentable matter between

the proximal surfaces of the teeth. Waxed floss silk may be introduced between even the closest teeth, and, as it is gently drawn to and fro towards the neck of the tooth, surfaces are cleaned which would never be reached by the tooth-brush. Ordinary embroidery, or skein silk, cut into short lengths and drawn across a piece of hard beeswax is quite as efficient, and much less expensive, than the reels of wax floss silk especially made for dental purposes. Short lengths of india-rubber, square or round, such as is used in the manufacture of elastic webbing, will also act in a similarly efficient way by being stretched. It passes between the teeth at the masticating surfaces, and on the tension being relieved it fills up the larger spaces towards the next, and as it is drawn through removes the *débris*.

Where teeth are placed somewhat apart, or where teeth stand alone, short lengths of ordinary thin narrow linen tape will be found efficient agents, while narrow silk tape, also well waxed, would be better where the teeth are closer.

Tracing cloth, such as is used by architects, in narrow strips, is another material which may be used either with or without being waxed, and has the advantage of being waterproof. Where the tendency to the formation of tartar is great the charging of the ligature or the band with tooth powder will do much to prevent the formation of deposits, presuming, of course, that the tartar has previously been properly removed with instruments by a dentist.\* Such a cleansing as this will take a considerable time for its proper execution, and, if the ordinary daily cleansings are thoroughly carried out, the more extensive processes of cleansing need only be performed at longer intervals, say about once or twice a week. The importance of attention to the cleansing of the proximal surface is

\* This operation of "scaling," as it is termed, should never be entrusted to the barber, or any such person, who employs an acid, euphoniouly called "spirits of salt," for this purpose.



apparent when we know that, with the exception of the grinding surfaces of the molars, the majority of the cavities of decay are on these surfaces.

The use of the toothpick is unfortunately essential to the comfort of some adults, but it should not be thought of as a cleansing instrument for the teeth of children.

If one starts with clean teeth, the teeth may be kept fairly clean by means of the tooth-brush, plain water, and floss silk, and "time," much time being given to the operation. In the light of our increased knowledge as to the causes of dental caries the particular value laid on tooth-powder tends rather to decrease than to increase. There can be no doubt, however, that the use of tooth-powder greatly facilitates the retention of the natural colour of the teeth, which I think is a better way to put it than the usual stereotyped expression that the use of a tooth-powder makes the teeth whiter: *that* a good tooth-powder does not and should not do. All that may be reasonably expected of it is that it will remove, by mechanical friction, stains and discolourations obscuring the natural colour of the teeth, which is, after all, far from being white.

The principal action of a tooth-powder, then, is rather to be regarded as mechanical. It is important, however, to regulate its frictional power. The powder should be very finely grained, and not gritty, therefore it should contain no cuttle-fish powder, no powdered oyster shells, no pumice powder, since these substances involve too much friction in their action. It should consist of alkaline substances, and contain no acid ingredients, nor such as are capable of changing to acids in the mouth, since these are extremely destructive to tooth structure. All fermentable substances such as carbo-hydrates, are therefore contra-indicated.

The presence of an antiseptic agent in the tooth-powder is desirable. Some antiseptic ingredients of tooth-powder are, however, to be condemned, for instance, charcoal and charred

bread, although both antiseptic and frictional, are too gritty, and from constant use lead to the formation of a permanent bluish border to the gum, owing to the particles becoming buried in the tissues.

Miller recommends precipitated chalk, taken up on the tooth-brush with a dash of neutral or slightly alkaline soap, but he also considers a tooth-soap as being preferable to tooth-powder. He has also pointed out that as a matter of fact there is no evidence whatever that anything has as yet been accomplished in the prophylactic mouth-wash alone. "It would, however, be going too far if we were to adopt the views of those who have expressed the opinion that by proper care of the teeth and constant use of antiseptic washes from childhood, decay would be entirely banished from the human mouth. This view is too optimist, for various reasons, chiefly because there are places in every denture which will remain completely untouched even by the most thorough application of the antiseptic which will reach them in so diluted a condition that it possesses little or no action. If a very thorough mechanical cleansing has not preceded the antiseptic, its action upon the centres of decay will be equal to little more than *nil*. The great difficulty lies further in the fact that nearly all the materials which possess antiseptic action are either contra-indicated altogether in the mouth, or that they may be used only in very dilute solutions either because they are injurious to the general health, or locally to the mucous membrane or to the teeth themselves. Finally, many otherwise useful antiseptics are excluded because of their bad taste and smell. For these reasons the preparation of a mouth-wash which possesses antiseptic action of any importance is accompanied by the greatest difficulties."

Miller has made an interesting series of experiments in order to determine the time necessary for devitalisation with a number of the antiseptic materials in the form of a mouth wash. As the time during which in rinsing

the mouth the wash remains in contact with the teeth varies from a few seconds to at most a minute, it will at once be seen that in order to sterilise the oral cavity a material must be found which is capable of devitalising bacteria within a minute or less. It is possible after the complete mechanical cleansing of the mouth to obtain by means of a solution of bichloride of mercury (1 in 2,500), the almost perfect sterilisation of the mouth. On account of its poisonous properties, and still more, perhaps, from its horrid and undisguisable taste, this material is not suitable for general application.

Listerine, which consists of oil of eucalyptus, borobenzoic acid, wintergreen oil, &c., has been proved experimentally to be a useful antiseptic mouth-wash. It should be applied on a brush on cleansing the teeth or slightly diluted as a mouth-wash.

Miller, in his important and valuable contribution on the Human Mouth as a Focus of Infection, calls particular attention to the measures which should be taken to prevent the undue growth of bacteria, pathogenic as well as non-pathogenic, in the mouth; the ultimate object being not alone to limit as far as possible the action of micro-organisms and their products upon the teeth, but to keep within bounds also the many various diseases which result from a lack of proper care of the mouth. He has found by experimental research that not one of the many mouth-washes with which the market is flooded, makes even an approach towards accomplishing this end. For the purpose of disinfecting the mouth in case of acute diseases, stomatitis, diphtheria, gangrene of the mouth, &c., physicians usually have recourse to borax, boracic acid, chlorate of potash, permanganate of potash, lime water, salicylic acid, &c., which, with the single exception of the latter, have next to no action whatever upon the bacteria of the mouth, though some of them undoubtedly have an excellent cleansing action upon inflamed or suppurating surfaces, in virtue

of which their use may be attended by very beneficial results.

A series of carefully-devised experiments were made to test the action of the antiseptic solutions upon the bacteria in the mouth itself, and not upon pure broth cultures. Miller found considerable differences in the time required for sterilising the saliva of different persons. From a long series of repeated tests he found that only saccharine and benzoic acid were left from which to construct antiseptic mouth-washes for daily use. Saccharine, especially in alcoholic solutions, manifests a very remarkable action upon the bacteria of the mouth. It is one of the least poisonous of the substances recommended for the treatment of the oral cavity, and has no deleterious action upon the teeth. Its greatest drawback is its intense sweetness, which, to some persons, renders it very unpleasant. It is not, however, the sweetness of sugar, saccharine not being one of the sugars, or even a carbo-hydrate.

Miller has prescribed these substances in the following form :—

|                 |    |    |     |
|-----------------|----|----|-----|
| Saccharine      | .. | .. | 2.5 |
| Acid benzoic    | .. | .. | 3   |
| Tinet. rhatani  | .. | .. | 15  |
| Alcohol. absol. | .. | .. | 100 |
| Ol. menth. pip. | .. | .. | 0.5 |
| Ol. cinnam.     | .. | .. | 0.5 |

A mixture of 3 parts of this to 27 parts of water kept in the mouth for a full minute, has a very marked effect upon the number of living bacteria in the mouth. If instead of water we use a 4 per cent. solution of hydrogen peroxide in connection with the tincture, the germicidal power is very greatly increased.

The best means, then, we have towards attaining this seeming impossibility of having a scientifically clean mouth is to rely on a very thorough application of mechanical means, tooth-brush, floss-silk, &c., aided by antacid and sterilizing washes, the efficacy of which will be in proportion to the time of contact.

The hygiene of the sick-room has been excel-



lently treated except on the question of defective personal hygiene as it affects the mouth, and as the subject is not mentioned as far as I know in any published work on the care of the sick, nor even in any popular treatise on the teeth, a few words here may not be out of place.

As a matter of fact, very few trained nurses give any attention to the teeth of their patients, everything else is carefully looked after, and kept clean with the exception of the mouth. As we have seen, bacteria play a very important part in the destruction of the teeth even in ordinary health, it is, therefore, easy to understand how much more that condition must be aggravated in the mouth of, say, a typhoid fever patient. The decay that frequently ensues from such cases is ascribed to constitutional conditions, but when we consider the increased temperature which accompanies the fever and the character of the dietary which is necessary to be given, and of which a large portion must remain in contact with the uncleansed teeth, it is evident that the bacteria have more than usual facilities for producing caries which in such cases must be regarded as arising from neglected local conditions.

Dr. Briggs, of Boston, has published some valuable hints and directions on this subject, and rightly emphasises it with a view to the comfort of the invalid: "If you wish to see a grateful patient, rinse the mouth with some antiseptic solution, after he has been left for days without care! I have had people tell me that nothing done for them in the course of their illness gave them such a feeling of comfort and rest as purifying the mouth."

"In extreme cases, where the patient is in a comatose condition, the mouth can be wiped out with a soft cloth wet with the antiseptic solution; but in most cases I have found the ordinary invalid feeding-cup to answer the purpose nicely. The patient takes the solution into the mouth through the long spout, and, having rinsed thoroughly, closes the lips about the

spout and forces the liquid back into the cup, all done without raising the head from the pillow.

"I have no doubt there are physicians and nurses who attend to this matter, but I also doubt not that they are few and far between."

The proper time for the principal act of this personal hygiene is after the last meal. To brush the teeth in the morning only, is to lock the stable door after the steed is stolen. To do so after each meal must obviously be salutary and so economic a proceeding, that the time necessarily involved is far from being wasted. To those who have never acquired the habit, it may seem irksome and unnecessary, but to those who have done so, comfort is not complete without even these supplementary cleansings.

*(To be continued.)*

## WORK AND EXERCISE.

THAT man gets, by well-directed and useful labour, the things needed for his sustenance, and for the education and discipline of his mind, does not admit of question. To preserve his health and strength and to have those enjoyments and comforts which he alone of the inhabitants of the globe can obtain and enjoy, man must work bodily or mentally. Thank Heaven! although the judgment of the world is often harsh and unfair, tinctured with prejudice, and distorted by conventionality, in honest toil there is no degradation. Idleness alone is disgraceful. To live on what a man's own labour has acquired is noble and honourable. To fatten on the ill-paid toil of others is degrading and dishonourable.

The laws of health may be remembered and practised, but if one of them is neglected, and that one—systematic labour, there cannot be, in the highest sense, peace of mind and vigour of body. These, above all else, make life happy and conduce to its preservation in perfect health. No one would suggest that the writer

and the thinker should give themselves up to manual labour, or that the statesman should relieve his overtaxed powers by following the plough one or two days a week—although Lord Sherbrooke's liking for cycling exercise, and Mr. Gladstone's skill as an axeman are instances of intellectual toil accompanying severe manual labour. What is meant is that every man born into this beautiful world can find work to do, and whatever it is, is bound to do it conscientiously and energetically. In honest and useful work alone is contentment possible. As the evening of life approaches, and the toiler looks back and sees how much he has done, there must be a feeling of unalloyed satisfaction to which many a millionaire, who has passed his days in idleness and luxury, is a stranger; but yet how many men can feel satisfied with what they have done? How many, rather, even among the best, have to mourn over opportunities wasted, and inferior work done. The humble mechanic, working at the bench, may, in this sense, be a nobler specimen of manhood than the head of a large factory.

Some of the rules applying to the regulation of labour are most important, and on their observance depends much of the success rewarding effort. The powers of the mind and the body require, for full perfection, to be developed and exercised. Although it does not follow that a man who only cultivates half his powers is not leading a useful life, yet, unless mind and body are in vigorous working order, pleasure of the highest kind cannot be the result. The barrister or the physician may, each in his way, increase the happiness and prosperity of his clients; but his own health suffers and his bodily vigour is impaired, if, content with training and using his brain, his muscular powers are neglected and allowed to waste. The labourer, again, whose work is manual, needs intellectual relaxation in his leisure hours to develop his higher nature, and invest his life with dignity.

There is common sense in the suggestion that

every man should learn a trade, at which, in his spare hours, he might amuse himself. Unfortunately trade customs, and the exigencies of a professional career, make such a thing impracticable. The clergyman and the author need not, of course, know how to shoe horses or make nails; it is most important, however, that no one whose mind is severely strained should forget to spend some leisure moments in bodily work. Marked improvement in the health of many clergymen, for example, and a decided and welcome freshness in the tone of many sermons would be apparent were the preacher oftener to come out of his study and read that great book of Nature everywhere unfolded before human eyes. Work, manual and intellectual, was meant to be a pleasure, a privilege; and when not so viewed, something is wrong.

Most men are destined to pass their lives at mechanical labour. What of that? Apart from other considerations, the mental discipline which every labourer can get from doing his work as well as he possibly can is invaluable. The carpenter at the bench, and the smith at the forge, may have their intellectual powers developed and strengthened, and may be happy and contented, throwing their full energies into their task, and finding in it a labour of love, a boundless field for ingenuity. But although they might make a profession of their occupation, they would also need that mental training only to be got from books, and from pondering over the best thoughts of the best minds.

Labour ought not to begin very early in life. Setting aside the importance of calling forth the powers of the intellect by a few years of school, it is most cruel to consign a child of eight to a factory. His body needs time and fresh air to grow in stature and strength, and the development of the muscles, and the consolidation of the frame tax the youthful system sufficiently. Hard work and rapid growth cannot go together. The lifelong future may be blasted by the selfishness and folly of parents in compelling a child to work while still very young.



The physique and health of town labourers had begun to deteriorate in consequence of the neglect of this important matter, when, fortunately for the happiness of the poor and the prosperity of the nation, the law interfered, and up to a certain degree, took the young under its protection. Something has been done, but not enough. There is room for further reform in the same direction.

One of the greatest advantages which the wealthy enjoy is that their children are not sent out early into the world, and when they pass into active life, are not compelled to attempt work beyond their strength. Lads often learn little at school, and leave too early as far as book-learning goes; still, time is given them to grow, and gain strength, and so they enter offices and shops better able to work and advance themselves. Partly in consequence of not being forced to work so early, less sickness and greater longevity are more often the rule among the well-to-do than among the poor.

Young men ought not to be closely confined and at the same time very hard worked. Attention to these matters is repaid by greater usefulness and vigour in later life, and under any circumstances, amusement and frequent change of air, good at all times and for all classes, are especially necessary for the young. Persons employed in shops and factories should live some reasonable distance from their work; and never, when it can be avoided, on the spot where they work. A walk, morning and evening, is of service to them, and it is often found that over-worked and unhealthy clerks get stronger and healthier when they move to such a distance from their offices that they can enjoy a short walk several times a day. Heavy work should not begin in the morning until a comfortable meal is taken. In the middle of the day a substantial meal is again necessary, and food should never, whatever the excuse, be hastily eaten. It is bad policy to hurry through meals.

The place of employment calls for some thought. The workroom or office ought not to be small,

but whether small or large, should be well ventilated. In the former case this is not easy, as draughts can hardly be avoided; that shows the importance of large rooms. It would often pay employers to attend to these matters, and to lay out a good deal of money upon them. Nothing is more ridiculous than to say that any kind of place will do for an office or a workroom. The heavy outlay incurred in building large, convenient workshops, would be more than decayed by the extra work done, and the better health of the work-people.

Persons compelled to stand while working, and to use the muscles of the whole body, are usually healthier than those compelled to sit in an unnatural and cramped position, and it is especially important that the latter should, whether fine or wet, hot or cold, walk a mile or two, morning and evening.

The employment chosen ought not unduly to tax the health and strength of the labourer. Light occupations should be allotted to the small and weak, while unhealthy employments and those requiring great bodily strength should only be undertaken by the robust. Hard though it may seem to condemn them to such a life, it is the healthy who ought to choose indoor work, while the feeble and unhealthy should, far oftener than now, work in the fields or in the open air.

Shop work is notoriously unhealthy; this is due to the heat and bad ventilation of such places, and to the number of hours of confinement, but it is inexcusable that respectable tradesmen should keep their shops open fourteen or fifteen hours a day. There is no earthly necessity for such a thing; besides, it is barbarous to confine assistants and apprentices so many hours. Labour, instead of a pleasure, becomes an intolerable burden.

Of all forms of exercise walking is, under most circumstances, the least useful, unless in the company of friends whose pursuits are somewhat different, so that the conversation does not return to topics already sufficiently

engrossing the attention. For example, it is better that a clergyman and a merchant should go out together for a stroll than that both should select members of their own calling, although in the latter case congeniality of taste and similarity of occupation would give many men additional topics of conversation, and members of the same calling are attracted to one another. Riding, shooting, and fishing are admirable; but some purely manual employment is better. A large garden is a capital field for exercise, and in digging and working in it for two or three hours a day, four or five times a week, abundant pleasure and health would be found. In great towns, where gardening is impossible, professional men need not be ashamed of a little carpentry, or chopping up the wood for the fire. These, of course, are only crude suggestions, but the great fact to be borne in mind is that some kind of manual labour is important.

Those are miserable creatures who make what they call pleasure their occupation, and throw away their lives in selfish and sensual pursuits. They squander the precious years of youth, and prematurely end their days in disease and disappointment. Every man, whatever his fortune and rank, should in youth, at any rate, follow some profession or occupation. All labour is honourable. In every sphere of life, and in every part of the world, useful work is possible: but care should be taken, when the opportunity offers, to select a suitable occupation. No absurd notions as to the dignity of a profession should make a fond parent consign his son to an employment in which few succeed. Better to be a respectable and hard-working grocer, printer, butcher, or draper, than a poverty-stricken and disappointed clergyman, doctor, or lawyer. AN OLD OXONIAN.

## PATENT MEDICINES.—No. 11.

### WARNER'S SAFE CURE.\*

"I'll call for pen and ink, and write my mind."—SHAKESPEARE: King Henry VI.

IN resuming these articles, temporarily interrupted by the illness of the writer, it would amount to an act of gross ingratitude were we to omit reference to the many favourable and encouraging notices which have appeared in the metropolitan and provincial press. If we were to reprint the whole of these they would crowd out all the contents of the present number. Besides, though "we have great cause of thankfulness,"<sup>1</sup> "'tis odds beyond arithmetic"<sup>2</sup> against our ability to fully express our feelings towards all (and here we include other friends besides those connected with the Press) whose helping encouragement has been the "very heart of kindness."<sup>3</sup> Could we adequately interpret our sentiments we might have "had most pretty things"<sup>4</sup> to say; still, after all, "words are not deeds,"<sup>5</sup> and it is through these latter that gratitude is best shown. Moreover, although our "heart is great"<sup>6</sup> we "have no tongue"<sup>7</sup> equal to our purpose. We trust, therefore, that our friends will "be not offended"<sup>8</sup> if we "be brief"<sup>9</sup> and "not of many words,"<sup>10</sup>

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\* This article is the second of the new series, which commenced with Beecham's Pills, published in the January number of HYGIENE (No. 49.) The first series of analyses of, and reports upon, many of the most widely-advertised nostrums of the day, including Clarke's Blood Mixture, Holloway's Pills and Ointment, Sequah's Oil and Prairie Flower Mixture, Mother Seigel's Syrup, Mattei's Electro-Homœopathic Remedies, Revalenta Arabica, Chlorodyne, and other Opiates, Allen's World's Hair Restorer, Rowland's Kalydor, Singleton's Golden Ointment for the Eyes, Mexican Hair Restorer, Gowland's Skin Lotion, etc. can now be obtained, reprinted in book form; 128 pages, price 1s., post free for fourteen stamps, from Beaumont and Co., 39, Southampton Street, Strand London.

<sup>1</sup> "King Henry V." <sup>2</sup> "Coriolanus." <sup>3</sup> "Timon o Athens." <sup>4</sup> "Cymbeline." <sup>5</sup> "King Henry VIII." <sup>6</sup> "King Richard II." <sup>7</sup> "King Henry IV., part 2." <sup>8</sup> "All Well that Ends Well." <sup>9</sup> "Merry Wives of Windsor." <sup>10</sup> "Much Ado about Nothing."

AGRICULTURAL DEPRESSION. — Owing to the depreciation in value of farm property, through the agricultural depression of the last fifteen years, the income of Guy's Hospital from its landed estates has shrunk since 1875 from £41,840 in that year to £27,550 in 1891.



but try to concentrate our acknowledgments by sincerely saying "much thanks."<sup>1</sup> "Let that suffice"<sup>2</sup> for the present. In the future "our best endeavours shall be done herein"<sup>3</sup> to "study deserving,"<sup>4</sup> so that we may "prosper well in this"<sup>5</sup> undertaking; such as has never been systematically attempted previously, except by our excellent contemporary the *Saturday Review*, which published some scathing articles on patent remedies some years ago.

We fancy that we hear a practical reader murmur "Thank goodness, the Editor has finished his string of quotations from Shakespeare at last, and is coming to matter-of-fact." We will explain to our practical critic later on how it came about that we have laid the immortal bard so extensively under contribution, if he will bear with our wandering pen a little longer, and also kindly take into consideration that these articles do not profess to be scientific essays, but, rather, roundabout papers,—a phrase first used by our good old friend, William Makepeace Thackeray, as the title of those charming compositions of his which did much to make the earlier numbers of the *Cornhill Magazine*, with their distinctive yellow covers, so specially welcome to magazine-readers, far away back in the "sixties." Leading writers of fiction then, like owners of race-horses, had their favourite colours; the orange-tinted outsides of Thackeray's serials and the green wrappers of Dickens' works were ever-attractive to their crowds of admirers. Further, like Pandarus, in "Troilus and Cressida" ("Shakespeare again," our practical reader will exclaim), we would observe, "He that will have a cake out of the wheat must tarry the grinding."

Meantime we will go back to the *Saturday Review*, which spoke so well of us in its issue of March 5th, 1892, that our ears would have tingled simultaneously if, instead of being separated merely by a few inches of thick bone

and indifferent brain tissue, they had been as far apart as those of the cunning knave (described in the pages of Joe Miller), who, going into a haberdasher's shop, with his hat slouched down to one side of his head, inveigled the unsuspecting shop-keeper into an agreement to sell him for a low sum a piece of costly material: "as much as would reach from one of my ears to the other," said the artful rascal. Upon the price being struck, he cocked his hat into the proper position, and coolly pointing to the only ear which was apparent, informed the astonished tradesman that the other ear was at Constantinople nailed to the pillory. Result: Speedy exit of the wily customer, with a good round sum of money in his pocket as compensation for cancelling the bargain.

The *Saturday Review*, in the notice to which we have referred, says, "The Editor of HYGIENE has re-issued a series of articles,\* exposing the pretensions of certain of the most popular patent remedies. The method of exposure employed has been simple and drastic. The nostrum has been submitted to analytical examination, and in each case has been discovered to be a preparation of well-known ingredients, well-known not to possess the properties claimed by the vendors for their secret compositions. "Clarke's Famous Blood Mixture or Purifier," for instance, consists, says Mr. Stokes, the public analyst, of iodide of potassium, chloric ether, potassium hydrate, and coloured water. To claim for this combination that it is a never-failing and permanent cure for scrofula is—to put it with a decent restraint not noticeable in Mr. Clarke's advertisements—a little extravagant. The assertion, therefore, made by the proprietors of the Blood Purifier, apparently without fear of contradiction, that that medicine is the only cure for consumption, diabetes, dropsy, deafness, and paralysis, is an over-bold

<sup>1</sup>"Hamlet." <sup>2</sup>"Othello." <sup>3</sup>"Merchant of Venice."  
<sup>4</sup>"King Lear." <sup>5</sup>"Twelfth Night."

\* "Patent *alias* Quack Medicines." Reprinted from HYGIENE. London: Beaumont and Co., 39, Southampton Street, Strand. 1892. Price 1s.

one. 'Mother Seigel's Syrup,' 'Sequah's Prairie Flower,' and Holloway's Pills can jointly cure everything and can severally make a good job of most things (at any rate, so their manufacturers unhesitatingly suggest). But the man of scales has reported on them, and for the future in unimaginative minds they can only be credited with the virtues of their one active ingredient, Aloes. So far, the triumph of the editor of HYGIENE has been complete." The *Saturday Review* goes on to descant upon the rise and fall of quack remedies, and the difficulties in the way of attempting "to make laws for the effective protection of the pockets of the gullible." "Quacks have been, and quacks will be, and there will always be a public ready to heed them, and happy to pay them," observes the *Saturday Review*. "Admitted," we reply; but our argument is that the British Government, for the sake of obtaining an annual addition of some £100,000 or so to the national income, by the issue of patent medicine stamps, tolerates and even endorses quackery, for many, and especially ignorant people—not always of the lower classes—are foolishly deluded by the Government stamp and the word "Patent" into a belief that they convey a sort of guarantee of quality. As to laws for protecting the gullible, the unwary, and the ignorant, such exist in connection with every other mode of imposture. Nor would any elaborate legislation be needed. If an individual buys a pound of coffee, to which chicory has been added, he has his legal remedy under the Adulteration Act, unless the dealer has previously placed upon the packet a legible printed label showing that the contents are not pure coffee, but coffee and chicory mixed. In the same way, instead of shrouding a quack medicine in mystery—*Omne ignotum pro magnifico* is the theory of many people—and lending it a fictitious value by affixing an official stamp, let the Government pass a short Act of Parliament, similar to the legislation which prevails in

various continental countries, requiring the contents of every bottle, box, or packet of quack medicines to bear a label stating its real composition. People generally are getting more educated than they used to be, and education is the deadliest foe that quackery can have. Would any man or woman of sound mind and even very moderate education, if he or she learned from the printed label on a patent medicine that it consisted of water, aloes, and carbonate of soda, with a few drops of the tinctures of capsicum and myrrh,\* be likely to give credence for one moment to the preposterous assertion of its vendors that "thus compounded" (we copy this statement verbatim from the prospectus accompanying a bottle of this stuff, sold at the rate of a shilling an ounce, seven-eighths being water, and the other ingredients the commonest and cheapest of drugs) "PRAIRIE, FLOWER is undoubtedly far and away the best remedy ever yet introduced for all sorts of complaints and other CHRONIC DISEASES." The capitals in this singularly worded extract are, we need scarcely say, not our own, but those of the compiler of the prospectus, who evidently acted on the vulgar rule that when anyone tells a lie he should tell a big one and stick to it.

There was once an American quack pill, whose discoverer and inventor—quacks are remarkable people, for they invariably discover and invent, according to their own version, things which have been known ever since the world began—claimed for it the meritorious qualities that it didn't "go fooling about, but settled down steadily to business;" and we expect that our practical reader will accuse us of the one, and charge us with not doing the other, unless we forthwith say something about Warner's "Safe Cure." "Safe Cure," indeed; that is what its inventor and discoverer would probably, in his Trans-Atlantic vernacular, call

\* See analysis of Sequah's Prairie Flower Mixture at page 63 of "Patent *alias* Quack Medicines."



"a tall order," if the nomenclature emanated from anybody else. Still, it is not absolutely original; years ago there flourished a music-hall celebrity, one Mr. Stead,—we hasten to explain; not the gentleman of that name who poses as the champion of Mattei and his electricities, white, red, and green!—who jumped himself into fame as the "Perfect Cure."

We have before us an analysis of the "Safe Cure for Bright's Disease, etc.," of which we will give particulars. But we must first of all redeem our promise to explain the Shakespearian eruption at the commencement of this article. During our illness, as at other times, Shakespeare has been a frequent companion, and we have got into the almost unconscious habit of clothing our thoughts in Shakespearian language. Indeed, it was when reading one of Shakespeare's works that Warner's "Safe Cure" came into our mind. An extraordinary concurrence of ideas, some will remark, and difficult to account for; yet they should remember that it has been paradoxically asserted that the improbable often becomes the possible. Macbeth thought himself on the safe side when he more than hinted at the physical impossibility of Birnam Wood's removal to Dunsinane, but he had to own up to his mistake very soon afterwards. Which play of Shakespeare was it that suggested the "Safe Cure"? Our publishers do not find it necessary to stimulate the circulation of *HYGIENE* by giving away pounds of tea or other bonuses to subscribers, or offering conundrums for competition, so that there can be no excuse for delaying the answer—King Henry IV., wherein Hotspur makes mention of his prisoner's decided objection to "villainous saltpetre." Of course, seeing that the prisoner had just run a narrow risk of losing his life in the battle, the epithet he made use of was excusable; otherwise it might seem rather too strong a term to apply to what is, and has been for centuries, quite a common article of commerce. How would Colonel North, the uncrowned Nitrate King,

like to hear anyone speak of nitre in such uncomplimentary language? But we did not happen to think of him. We thought of Warner, and of what a lot of saltpetre there must be in his "Safe Cure."

We were right, too, for an analysis recently made of this proprietary medicine, by Mr. A. W. Stokes, F.C.S., F.I.C., public analyst, revealed the fact that three hundred and fifteen grains of saltpetre were contained in a sixteen-ounce bottle. Sixteen ounces! Rather a stiff quantity of physic, this. Warner and Co. think so, too, evidently, for they make the boast, "Our bottle is the largest 4s. 6d. bottle in the market." We will not attempt to disprove this assertion, but we should have preferred its being half the size and half the price, as we bought it, not for home consumption, but with the view of sending it to our analyst. If a "largest bottle" craze should seize upon the nostrum-loving public, we may expect eventually to see further developments in this direction on the part of other patent medicine vendors, such as notifications announcing "on tap," "in the customer's own jug," and "small casks for family use."

The dose recommended by Warner and Co. is a tablespoonful, *i.e.*, half an ounce, six or eight times a day. Eight doses would equal four ounces; four ounces, multiplied by four, equal sixteen ounces, and hey, presto! in four days the largest bottle in the market has been emptied, and gone with its contents are four shillings and sixpence, good and lawful coin of the realm.

Now what has the purchaser had for his money, besides 315 grains of nitre, *alias* saltpetre, *alias* nitrate of potash, the value of which anyone, curious on this point, can ascertain at the nearest drysalter's. Why, Mr. Stokes tells us that, in addition to water and the aforesaid saltpetre, he extracted from the sixteen ounces of fluid one and a quarter ounce of glycerine, half an ounce of burnt sugar or treacle, two ounces of rectified spirits, a few drops of oil of wintergreen, and a vegetable

extract bearing resemblance to extract of liverwort. He could not find any alkaloid, or any of the usual drugs employed in the treatment of Bright's disease. "My belief," he adds, "is that the nitre is the only active ingredient present." We cordially endorse Mr. Stokes' candid opinion, and we also believe that any person who would attempt to treat such a fell disease as that which Warner and Co. profess to eradicate with either saltpetre or glycerine, or burnt sugar or treacle, or rectified spirits, or oil of wintergreen, or extract of liverwort (the two latter in such small quantities that we should have to seek the aid of fractions to enable us to calculate the amount taken for a single dose) would not have so much difficulty as Dogberry experienced ("Much Ado about Nothing") in getting himself written down an ass. If wintergreen and liverwort do not show up in any large proportions, the same cannot be said of spirits, which constitute one-eighth part, or  $12\frac{1}{2}$  per cent. of the whole quantity; yet there is no disease in which more care should be exercised in the use of alcohol than in Bright's disease.

It goes almost without saying that Warner and Co. issue, broadcast, circulars dilating upon the paramount necessity of everyone who feels out of condition at once proceeding to drug himself with their preparations. "The doctors cannot cure you—this they admit," Warner and Co. dogmatically affirm in one of these pamphlets. A bad look out for every man or woman who is, or fancies that he or she is, not in health. Yet, there is a silvery lining to every cloud—or rather, in this instance, a particularly brassy one—for this consolation to the afflicted speedily follows:—"Treat yourself with Warner's Safe Cure, and live." All that the medical faculty can do in Bright's disease is to "make dying comfortable." "Thousands of people die every year from supposed apoplexy, convulsions, heart disease, paralysis, gangrenous erysipelas, and other quick-ending disorders, when in reality they are the victims of chronic

Bright's disease. As their physicians cannot cure it, they therefore, to cover their inability, attribute death to other causes." And so on, till we are lost in amazement at the mean, despicable falsehoods that some people will be guilty of, to make money; for the object of these pamphlets, dropped into family letter-boxes, and given away indiscriminately, is to promote the sale of the "Safe Cure."

One of these pamphlets, left at our private house last week by a man who was distributing them throughout the district, contains an earnest invitation to those into whose hands it may fall to forward by parcels post a six-ounce sample of their urine to H. H. Warner and Co., Limited (Medical Department), for examination; the charge made being 2s. 6d., "barely sufficient to cover the cost of chemicals." What is a humble half-crown compared with a "long practical experience, involving the examination of *many thousand* samples annually?" But how can Warner and Co. get through this amount of chemical and microscopical research, and to whom do they entrust such responsible duties? Mr. Warner's valuable services cannot always be relied on. Even if his health, however much fortified by nitre, syrup, etc., did not break down under the continuous strain imposed on him, he must at times be absent. Only a few weeks ago, we read in an American paper that he was then at Rochester, State of New York, superintending his "mammoth yeast" business, and making arrangements for bringing out Warner's "Safe Baking Powder," which he assured an interviewing reporter, who straightway blazoned the circumstance in a "mammoth" puff article, would be "as far in advance of the powders now upon the market" (the "largest bottle" is already there) "as our 'Safe Remedies' are above the vile imitations and substitutes which are offered in their stead." Really, after what we have learned from Mr. Stokes' analysis, we would just as soon have vile imitations and substitutes as villainous saltpetre. Do the English directors of H. H. Warner &



Co., Limited, conduct many thousands of urinary analyses annually? Hardly likely, we should imagine, that they would undertake scientific experiments on such a gigantic scale. Certainly not, and, on looking through the pamphlet again, we came to the conclusion that "the physicians employed in our Medical Department" must be the persons who, during Mr. Warner's unavoidable absence owing to the demands of yeast and baking powder on his attention carry on the laboratory work. This does seem cool, not to say cruel conduct. In one paragraph the sufferer is told in the most positive language that doctors cannot, and admit that they cannot, cure him, and at the best they can only enable him to die comfortably; in another, that "our physicians will gladly give the benefit of their knowledge, free of cost." If we believed in all that Warner and Co. said, we should estimate the "benefit of our physicians' knowledge" as appraised in the preceding sentence at its exact value. But "our physicians" are not the guileless philanthropists that Warner and Co. would have us imagine. A letter was shown to us not long since, written to a young man by "our physicians," or one of them—in their impatience to benefit humanity, Warner and Co. have omitted to inform the public as to the strength of their medical staff, or even to give the names of their doctors—in which the following paragraph occurs:—"Charge for the month's treatment is £4 4s. If a second month's treatment is necessary, charge is £3 3s." With this letter was enclosed a printed consultation form, containing some of the nastiest suggestions that could be put into a youth's head. Presuming that the fee was considerably dropped every successive month, in the same ratio, our young friend calculates that the fifth month's treatment would have been literally "free of cost." But it will never reach that stage, and even the Parcels Post six-ounce package and the half-crown for bare expenses, will never pass the portals of H. H. Warner and Co., Limited. We cheerfully gave

the benefit of our knowledge and advice, free of cost, as they would say, in the single word indelibly engraved on our memory by *Punch* in his advice to young people on another subject,—DON'T.

THE EDITOR.

## THE HEATING AND VENTILATION OF BOARD SCHOOLS.

WE have never come across a more carefully compiled Report\* than that upon which this article is based, and, although it is so far of local character in the circumstance that it was drawn up primarily for the information of the Dundee School Board, it takes such a wide range of schools situated in other towns that it assumes national importance.

For the purpose of the report Dr. Carnelley personally visited and obtained detailed information from no fewer than 150 different schools, having a total accommodation for 111,000 children. With only two or three exceptions these were public schools under the Dundee, Aberdeen, Edinburgh, Newcastle, Leeds, and Salford Boards. Detailed information was also obtained in reply to printed forms, from 173 different Board Schools, with accommodation for 165,000 children in Greenock, Bradford, Sheffield, Nottingham, Northampton, Leicester, Birmingham, and Liverpool; while general information was procured from the London, Glasgow, Accrington, Govan, Manchester, Paisley, and Finchley Boards. Besides all the particulars from public schools, accommodating more than a quarter of a million pupils, numerous experiments were made in the mechanically ventilated schools in Dundee, Aberdeen, Govan, and Paisley, with a view to measuring the volume of air passing through the schools, the

\* Report on the Cost and Efficiency of the Heating and Ventilation of Schools. By Thomas Carnelley, B.Sc. (Lond.), F.C.S., Professor of Chemistry in the University of Aberdeen, and Member of the School Board of Dundee. (Assisted by John Foggie, University College, Aberdeen.) Dundee: Winter, Duncan, and Co.

amount of gas consumed by the gas-engine, etc., and the effect produced by filtering the air mechanically introduced into the rooms. The amount of labour involved in the production of this report must have been very considerable, and, in point of fact, the obtaining materials for the report and drawing it up occupied nearly a whole year.

Of the various methods of heating, it appears that the one most extensively used is the system of large hot-water pipes (low pressure). Out of 311 schools examined in this respect, 147 were found to be warmed in this manner, while only 82 were heated by open fires; 32 partly by open fires and partly by stoves; only five (all in Salford) were warmed by hot air.

The most common mode of ventilation is by the ordinary admission of fresh air by open windows or doors, or, in many cases, by Tobin's tubes; whilst the usual outlet is the open chimney or ventilators placed in the roof.

The first cost per head of the different methods of heating and ventilating is not so much affected by the size of the school as might have been expected. The "open fire" schools in Dundee would appear to be much "under-fired," as compared with other towns; and whereas the general average in other towns is one fire to every 60 pupils, there is only one fire to every 80 in the Dundee schools. In Newcastle-on-Tyne four times as much coal is burnt per fire as in Aberdeen, and nearly three times as much as in Dundee; and the consequence is that, although coal is very much dearer in these two Scotch towns than in Newcastle, yet the cost per fire is nearly twice as much in the English town as in the former. Indeed, the figures furnished by Dr. Carnelley show that the cheaper the coal the greater is the quantity consumed by each fire. When we consider, too, the fact that the number of fires to a given number of pupils is less in Dundee than it is elsewhere, so that, taking every point into account, only three tons of coal are burned in the Dundee schools as

against seven tons in six other Scotch and English towns, we cannot but endorse the conclusion arrived at by Dr. Carnelley, viz.:— Either that the school children are being comparatively frozen in Dundee (also in Aberdeen), or that they are being roasted in Newcastle, as well as in Leeds, where a similarly high rate of consumption of fuel prevails. We believe that the relative quantity of coal burned in Newcastle and Leeds schools is more than is consistent with wise economy.

As to the annual cost of heating and ventilating, it is distinctly greater in small than in large schools; and this observation especially holds good with respect to the mechanically ventilated schools. A comparison of the annual cost per head of the different systems scarcely shows any difference between the "natural" systems, except that stoves are, on the whole, the cheapest, and small hot-water pipes (high-pressure) the dearest method, and mechanical ventilation costs more than the ordinary methods, in the proportion of nearly £20 per annum for a school accommodating 1,000 children; but this comparison is made under conditions which are most unfavourable to the mechanical system, owing to the calculations having to do chiefly with towns where coal is most economically used.

With regard to the efficiency of various systems, those in which the rooms are heated by radiation rather than by conduction, the air is much more highly charged with micro-organisms than in the methods where conduction is the principal way in which the heat is conveyed.

The recommendations which close the report are very important, and should be carefully weighed by all the School Boards about to erect new schools. Mechanical ventilation should be preferentially employed, says Dr. Carnelley, for the following reasons: 1. It is more comfortable, the rooms being kept warmer, and the temperature being more uniform and more equally distributed; whilst draughts are as far as possible avoided. 2. It



is much healthier, and prevents the spread of infectious diseases, owing to the rooms being supplied with purer air. 3. Its sanitary advantages make themselves felt in the fact that the children are enabled by its adoption to derive greater benefit from their education. 4. It increases their grant-earning power without increasing the labour of earning the grant. 5. It increases the teaching power of the teacher. These advantages more than compensate for the extra cost entailed by mechanical ventilation as compared with ordinary methods, which (including both annual expenses and interest on first cost) is about £39 a year in a school of 1,000 children, or 9½d. per head. For a school of 1,500 children, the ratio would be only three-fourths of that for one of 1,000 scholars. The cost could be further lowered by reducing the customary height of the rooms by one or two feet, which could be effected without in any degree detracting from the health or comfort of the children. A two-horse power gas-engine should be used as a motive power for driving the fan. A 48-inch fan should be used as the air-propeller. The fresh air should be blown in and not sucked out of the school. High-pressure hot-water pipes should be used for heating. The heating pipes should be placed in the air-chamber, and not in the flues; this would reduce the first cost. Arrangements should be made for mixing cold with the warm air, when necessary, before the latter enters the rooms. The air and heating chambers should be arranged in the basement. There should be only one main inlet air-shaft, but of large size; and it should be freely open at the top, and not fitted with Louvre boards. The incoming air should be filtered through coarse jute cloth placed diagonally across the huge inlet flue, and inclined towards the current of air, so as to allow of the filtering cloth being readily cleaned without being taken down. It may be mentioned, in passing, that these simple and cheap filters are so effective in removing much of the solid impurities from the air, that in the course of a

couple of months several pounds' weight of soot and dust are accumulated upon them. A jute cloth filter having an area of 15 square yards would cost only 2s. 6d., with about 10s. in addition for the wooden frames. The frames will last for years, the filter-cloth doing service for a year. The use of these filters increases the volume of air passing into the room by steadying the current.

The fresh air inlet shafts should be much wider and shallower than is commonly the case, so as to distribute the air in a thin stream, and to minimise the amount of draught. Schools should be built to accommodate a large number of children, large schools being heated and ventilated much more economically per head than small ones, especially when mechanical ventilation is used.

We will conclude this article by quoting Dr. Carnelley's summary of the *pros* and *cons* of the various systems which he had under his observation.

#### CERTAIN ADVANTAGES AND DISADVANTAGES OF THE SEVERAL SYSTEMS.

##### OPEN FIRES.

##### *Advantages—*

- (1) More cheerful.
- (2) First cost much less than hot-pipe systems.
- (3) Keeps air fresher than hot pipes, owing to draught up chimney.
- (4) So far as the Dundee schools are concerned, the temperature in the open fire schools was higher than in those heated by hot pipes.
- (5) The rooms of these schools will probably need painting less frequently than those heated by other systems.

##### *Disadvantages—*

- (1) Greater labour in service.
- (2) Slightly greater annual cost than stoves, or steam-pipes, or large hot-water pipes.
- (3) Unequal distribution of heat.
- (4) Air more highly charged with micro-organisms.

##### STOVES.

##### *Advantages—*

- (1) Smallest first cost.
- (2) Least annual cost.
- (3) Probably more effective heaters than open fires.

##### *Disadvantages—*

- (1) Greater labour in service.
- (2) Require more attention than open fires.
- (3) More liable to smoke than open fires.
- (4) More liable to get out of repair than open fires.
- (5) Not so cheerful as open fires.

## HOT PIPES.

*Advantages—*

- (1) Less labour in service than either open fires or stoves.
- (2) The class is not disturbed as in the case of attending to open fires and stoves.
- (3) More equal distribution of heat.
- (4) Air less charged with micro-organisms than when open fires are used.
- (5) On the whole the annual cost is probably *slightly* less than with open fires, but more than with stoves.

*Disadvantages—*

- (1) Not so cheerful as open fires.
- (2) First cost much more than in the case of open fires or stoves.
- (3) Air not so fresh as with open fires.

## MECHANICAL VENTILATION.

*Advantages—*

- (1) Much greater purity of air as regards all the constituents.
- (2) Efficiency of ventilation much more independent of the weather; whereas, with other systems, the ventilation is worst when most needed.
- (3) The schools are warmer.
- (4) More equal distribution of heat and of fresh air.
- (5) Very effective in diminishing the number of micro-organisms, not only at the time the mechanical ventilation is in operation, but also for a long time after it has been stopped.
- (6) Reduces draughts to a minimum.

In fact, the mechanical system heats and ventilates far better in every respect than any other system, and is, therefore, far more conducive to health and comfort, and to success in teaching and learning.

*Disadvantages—*

- (1) Greater first cost.
- (2) Greater annual cost (except in the case of very large schools).
- (3) Though in a town where several schools were heated and ventilated mechanically, there would not need to be more than an ordinary caretaker in each of such schools, yet *one* of these should be a man who had some knowledge of gas-engines, etc., so that he could attend to any repairs which might be necessary. Such a man would require a somewhat higher wage than an ordinary caretaker. This, however, would amount to very little if distributed over a number of schools.

W. A.

THE STORY OF A COFFEE PLANT.—Ten years ago the authorities at Kew Gardens sent out experimentally a number of slips of the coffee-plant to Blantyre, in Central Africa. All of these died on the journey, except one, which was particularly healthy and hardy. It grew, bore seed, and proved so productive that it was the progenitor of a million of plants growing on one estate alone, besides hundreds of thousands of plants in other localities. In three years these coffee plants begin to show a return; and the quality of the Shiré coffee obtained from them is so excellent that not long since it fetched as much as 112s. per cwt., wholesale, in the London market.

## Reviews and Notices of Books.

*The Treatment of Typhoid Fever.* By James Barr, M.D., Physician to the Northern Hospital, Liverpool, etc. Pp. 212. London: H. K. Lewis, Gower Street. 1892.

THIS work is a most important contribution to the literature of a disease which has attracted much attention of late years, partly on account of the mortality resulting from it—some sixty thousand deaths from this cause having been registered in England and Wales during the past ten years, representing half a million or more cases of serious illness—partly through the high social position of many of its victims, for no class of the community is free from its ravages, and partly because it is a preventable disease, and almost invariably associated with insanitary conditions of the water used for drinking or culinary purposes. As a preventable disorder, typhoid fever has frequently formed the subject of articles published in the pages of *HYGIENE*; but though preventive measures must necessarily occupy the first place in our columns, we are bound to give due consideration to remedial measures when, the barrier of prevention having been passed, curative treatment is called for.

Moreover, there are circumstances in which the most elaborate precautions against preventable diseases may, indeed must, fail, owing to the neglect of sanitary care at one point, thus weakening the relative power of resistance of all other links in the preventive chain. For instance, take into account the fact that at the present moment the greater bulk of the water supplied to the five millions of Londoners is derived from an admittedly dangerous source, the Thames, a river liable to pollution from the many populous cities and towns situated upon its banks above the intakes of the six great companies drawing upon the Thames near Hampton, Molesey, and Sunbury, namely,



the East London, the Southwark and Vauxhall, the Lambeth, the Grand Junction, the West Middlesex, and the Chelsea Water Companies. If, owing to some casual circumstance, such as frost, or a defective state of the filter beds at the commencement of the companies' service, the water passes in an impure condition into the mains, it must then be distributed in this unwholesome form to hundreds of thousands of houses; in how many of these are employed the only means, namely, boiling and filtration, capable of checking the admixture of disease-germs with the daily drink and food of the occupants? We may be styled pessimists, or charged with being alarmists, in consequence of our repeatedly directing public attention to the constant dangers to the health of the metropolis through using Thames water; but, at any rate, we have the satisfaction of performing our duty, and if, as an anonymous correspondent did not long since, people quote to us the old proverb about calling out before being hurt, we can return the compliment by pointing out to them, with greater truth, the equally old adage concerning the folly of omitting to secure the door until after the steed has disappeared.

The mortality from typhoid fever is high, ranging from 12 to 15 per cent., at the least, and therefore Dr. Barr may, with pardonable gratification, point to the fact that, under his treatment, only one death occurred out of fifty-five consecutive cases, all of which were treated in the hospital, and consequently subject, during the whole period, to the observation of his colleagues as well of himself. The patient who succumbed to the disease was a woman, suffering from very severe symptoms at the time of her admission (about the twelfth day of the fever), and mother of nine children (two of whom were subsequently admitted into the hospital, with typhoid).

Twenty-two of Dr. Barr's cases were treated in "the tank"; eleven others received some similar form of special treatment, such as the

wet-pack; while the remaining twenty-two were dealt with, according to symptoms, as they presented themselves. Twenty-one of the patients were under fifteen years of age, twenty-nine between fifteen and thirty years, and the five others over thirty years. As regards the stage of the fever when they were admitted to hospital, eighteen were brought in before the ninth day of the illness, twenty-one between that period and the fourteenth day, eight between the fourteenth and seventeenth, six between the seventeenth, and twenty-first days, and in two the exact day of the fever could not be definitely ascertained.

Treatment by water applied in the form of affusions, wet-packing, &c., has found favour with many medical men; but the continuous bath, although it has been used by Liebermeister and others for the treatment of bed-sores following typhoid fever, has never been had recourse to by anyone for the fever itself, previous to Dr. Barr's recorded cases. Some who have used the tank have interposed waterproof sheeting between the patient and the water, thus converting the arrangement into the water-bed originally devised by the late Dr. Neil Arnott, and, as Dr. Barr observes, quite distinct from the treatment by immersion, as adopted by Dr. Barr, and employed by him as an anti-pyretic agent for the last four years.

For full details of the tank, or immersion treatment we must refer our medical readers desiring complete particulars to the book itself, which abounds with sound practical information, and shows throughout evidence of original, patient observation, and close research. A history of the treatment of continued fevers from the time of Sydenham, who flourished in the second half of the seventeenth century, is worthy of perusal. "Sydenham's great success in practice," writes Dr. Barr, "largely depended on his close observance of natural laws; he aided and assisted the natural processes of cure, and did not thwart nature like many of his predecessors and successors." In Sydenham's opinion "a

disease, how prejudicial soever its causes may be to the body, is no more than a vigorous effort of nature to throw off the morbid matter, and thus recover the patient."

An introduction from the pen of Dr. W. T. Gairdner, professor of medicine in the University of Glasgow, from whose clinical teaching Dr. Barr states that he profited greatly during his studentship at that University, fitly prefaces Dr. Barr's work.

### PUBLIC HEALTH REPORTS.

SCARBOROUGH RURAL SANITARY AUTHORITY.—The medical officer of health, Dr. Cuff, reports during the past year a death-rate of 15·9 per 1,000, and a birth-rate of 24·8 per 1,000 of the population. Notwithstanding the circumstance that the births have greatly exceeded the deaths in the past ten years, the total number of inhabitants is less than it was in 1881, owing to the migration of people from the various villages included in the district to the large towns in search of permanent or more remunerative employment; a condition of things observable in many other county districts.

During the twelve months covered by Dr. Cuff's report, there has not been a single death registered under the heading of the chief zymotic diseases, and with reference to that portion of the report which has to do with the sanitary inspector we observe that the number of nuisances which required record was less than in any corresponding period for ten years; affording evidence of the fact that people generally are becoming more sensible to the benefits derivable from proper sanitary measures, and more ready to carry these out without official interposition.

Influenza was the most prevailing disease in Dr. Cuff's district during 1891, and in four villages alone 1,600 cases were reported, eleven of these having a fatal termination; in addition to these a number of persons were attacked

who did not come under the notice of any medical practitioner.

Dr. Cuff shares the opinion of many other competent authorities as regards the provision in the Notification of Infectious Diseases Act necessitating a dual notice, viz., an intimation from the householder, as well as from the medical attendant. Dr. Cuff states that in every case of infectious disease which has come under the care of medical men, not only have they promptly given notification, but they have also readily answered any questions and furnished additional information. The notices from parents seem to have been particularly unsatisfactory, and only two cases of alleged infectious diseases have been reported, independently of medical advice. In one of these the reported disease existed only in the imagination of the anxious parent; while, in the other case, upon the inspector visiting the house on the following day, he found that the supposed invalid had gone out for a walk, his ailment turning out to be an attack of typhoid some time previously in another part of the country.

Two cases of overcrowding had to be dealt with during the year—one, that of a man aged 60, his daughter, aged 19, and his two grandchildren, 5 and 6 years old respectively, all of whom slept in one room 10 ft. × 8 ft. × 6 ft. The other was that of a movable dwelling, 8 ft. × 6 ft. × 6 ft., in which eight people contrived to sleep. In the first case the nuisance was set right by the removal of the family into a larger house; the second was abated, so far as the Scarborough Rural Authority was concerned, by the family and their dwelling going out of the district—a sort of modern exemplification of Diogenes rolling away his tub when a change of scene and locality became necessary or congenial.

*Surbiton, Surrey.*—Population, 10,052. Medical officer of health, Dr. Owen Coleman. Deaths registered in the district in 1891, 140; leaving 136, after deducting four deaths in the Cottage Hospital of persons who had been brought from



elsewhere for treatment. This gives the low death-rate of 13·6 per 1,000 inhabitants. The death-rate for all England and Wales was 20·2. The deaths from zymotic disease were 42, including 10 from diphtheria and 2 from whooping-cough. Birth-rate, 20·8 per 1,000. The cases of diphtheria were mainly limited to the poorer classes, and were attributed by Dr. Coleman to defective general sanitary arrangements, such as damp, overcrowding, and the want of suitable ventilation, especially at nights. Dr. Coleman reports favourably of the working of the Notification Act, and gratefully acknowledges the ready assistance received on all occasions from his medical colleagues.

### FASHION AND BIRD-SLAUGHTER.

THE Society for the Protection of Birds have issued a timely pamphlet dealing with the wholesale slaughter, which must, in course of time, amount to absolute extinction, of various kinds of birds, for the purpose of gratifying the thoughtless, selfish vanity of women who decorate themselves with borrowed plumes obtained at the cost of so much pain, torture, and death. Some years ago our contemporary *Punch* thus apostrophised a gaily-attired lady, evidently vain of her apparel:—"The poor sheep and silkworm wore, Those very garments long before." But, at any rate, the poor sheep and silkworm did not have their lives specially sacrificed in order to enhance this lady's attractions.

Humming-birds, kingfishers, orioles, and other birds whose only crime is that they possess beautiful plumage, are shot down in hundreds of thousands annually, in accordance with the law of demand and supply, so that their feathers may adorn the hats and bonnets, or trim the dresses, of ladies—many of whom have such highly susceptible feelings, such delicately strung nerves, that they would shudder if anyone crushed an insect in their presence, and would cover their eyes and utter agonising,

piercing, screams at the sight of some mischievous schoolboy tweaking the tail of a favourite cat.

Nor do the plumes which a senseless, cruel fashion causes to meet our gaze everywhere, in the streets, in the theatres, even in places of worship, represent in any adequate degree the actual extent of carnage and cruelty requisite to supply feminine wants. Besides those birds whose plumage is in sufficiently good condition for subsequent use, a very much larger number are so much mangled as to be valueless, while a still greater proportion escape mortally wounded into the woods and thickets, there to die from loss of blood and starvation.

The white aigrettes so much worn in ladies' bonnets and hats at the present period are procured in warm climates under specially barbarous circumstances. The species of heron called egret, which furnishes them, is a very beautiful-looking bird, sligher in build and more graceful than the heron met with in England and other northern countries. Its feathers are of a pure white; but those plumes which find such favour in fashionable *modistes'* establishments grow only during the breeding season, when they droop from the back of the bird over its sides and tail. They are finest just about the time when the young egrets are fully fledged but not yet able to fly, and it is then that the hunters are keenest in their pursuit of the parent birds. Not unfrequently milliners have these feathers dyed in different colours, when they are commonly, though incorrectly, designated as "osprey" plumes.

Some women are cruel through utter selfishness and disregard for every living creature except themselves and their pets. Such must have been the one who inserted the following advertisement in a London evening paper last year:—"A lady wishes to have from the country a periodical supply of live sparrows for a favourite cat.—Address, with terms, *TRIXIE, &c.*" But we are not writing in the hope of touching the hearts of Trixies or Vixens. We

believe that the vast majority of women have fallen in with the fashion of wearing the feathers of wild birds without giving any consideration to the manner in which the market is supplied with such commodities. In such instances the proverb, "Evil is wrought by want of thought, as well as want of heart," thoroughly applies, and we have little doubt but that all ladies who have adopted the fashion through mere thoughtlessness will, upon becoming acquainted with the foregoing facts, discontinue it even more readily than they took it up.

W. A.

## Correspondence.

### DIET AND HEALTH

*To the Editor of HYGIENE.*

SIR,—The question of the value, or the reverse, of abstaining from flesh as an article of diet is a scientific one, and should not be ignored because of its being more or less associated with faddism. In a work on which I am engaged, some authenticated experiments up to date would be very valuable, and I should esteem it a favour if you would allow me to ask through your pages for an answer to any of the following questions by any of your readers who have experimented on themselves or have had cases coming under their notice of those who have abstained from flesh as food. The reply need merely mention the number of the question answered :

- (1) What was the effect on physical strength and endurance?
- (2) What was the effect on general sense of happiness of existence?
- (3) What was the effect on the mental clearness and power of perseverance?
- (4) What constitutional ailments were affected, and in what way?
- (5) What was the result with regard to colds, intestinal action, inflammations, and power of enduring heat and cold?
- (6) What did the diet consist of, and what was the approximate daily amount?
- (7) For what length of time did the experiment last?
- (8) Were tea, coffee, and condiments discontinued?

Yours faithfully,

JOSIAH OLDFIELD, M.A., B.C.L. (Oxon.)

Memorial Hall, Farringdon Street, E.C.

## Hygienic and Dietetic Notices.

COCOA is an article of such universal consumption as compared with what it was not many years ago, that the question of its purity has become one of considerable importance, on both dietetic and economic grounds. Unfortunately, cocoas of various makes, especially foreign, have found their way largely into the market, partly by means of misleading assertions as to their quality, partly through the manufacturers being able, by reason of inferior value, to supply shopkeepers at a rate affording a somewhat greater margin of profit than genuine cocoas would do. The public have the remedy in their own hands to no small extent, if they would buy none other than the cocoas of well-known English makers. These can be relied upon not only for purity, but for continued excellence. We have known instances where samples of cocoa have been specially submitted to analysts, whose reports have subsequently been published far and wide, but though the reports remain the same, unchangeable as the laws of the Medes and Persians were said to be, the cocoas have only served to remind a careful observer of the laws against adulteration, and the desirability of putting them into force. Not so, however, as regards some cocoas we could mention. We recently had occasion to examine a sample of Messrs. J. S. Fry and Sons' Pure Concentrated Cocoa. We found it merited the name just as it did some years ago, when we examined a similar specimen. Its aroma, flavour, purity, and strength keep it prominently in the front rank, and render it fully worthy of the high encomiums which have been passed upon it by analysts of such standing as Sir Charles Cameron and Dr. Hassall.

SACKLIN'S POULTICES, of which two samples (linseed meal and mustard) have been forwarded to us, will at once be welcomed by medical practitioners, and, indeed, by all who have to use this familiar form of medicament, as a great improvement upon the style hitherto in vogue. "Apply a poultice," says the doctor, and away he drives on his rounds, little thinking of the trouble which those few words of simple advice will create in the household after he has left. Hot water will be prepared—enough to give an adult a warm bath—mustard will be forthcoming in such a quantity that one can no longer wonder at the reputed fortunes of mustard manufacturers, and wardrobes and cupboards will be ransacked for suitable linen folds, until finally a (we cannot say "the," for that would be too definite an expression) poultice is ready for application, and the shapeless mass is conveyed, half-floating in superfluous water, on a large plate or dish, to the patient's bedside. The poor invalid's groans and other obvious signs of disapprobation show that in this, as in many other instances, one may have too much of a good thing, or rather, of what should come



under that appellation. The real fact of the matter is that very few people know how to set about making a proper poultice. Nor need any trouble themselves now to acquire the art and dexterity requisite for that process. Sacklin's Poultices are prepared with genuine materials, and sold in a convenient form, either for immediate use, or to be preserved till wanted. A portion of the size required can be cut off, and the remainder put by till some future occasion. Then, all that has to be done is to lay the piece of poultice on a dish, to pour boiling water on it, to dry its surface lightly, and to apply it according to the printed directions. How easy it is to quickly "apply a poultice" far better than any of home make, when it is all ready to hand, for use.

## Notes and News.

**TECHNICAL EDUCATION AT LINCOLN.**—The Mayor of Lincoln (Councillor Richardson) presided over a public meeting held in the Lincoln School of Science and Art last month, whereat Sir Philip Magnus, Director of the City and Guilds of London Institute, presented the prizes and medals to the successful students in both branches of the School. There was a very large attendance, and among the gentlemen on the platform was the Ex-Mayor (Mr. E. Pratt), Mr. W. Watkins, F.R.I.B.A. (past Mayor), Mr. Councillor B. Cannon, Dr. G. M. Lowe, Mr. Councillor Harrison, Canon Croft, the Clerk of the Worshipful Company of Plumbers, and others. The Mayor having opened the meeting, and the report of the School Committee having been read and approved, Sir Philip Magnus presented the prizes. After a few words of hearty congratulation to the recipients, he spoke at some length on the importance of technical education of those engaged in the building trades, especially plumbers, upon whose work the public health so much depended. The Clerk of the Plumbers' Company moved: "That this public meeting of citizens of the City and Borough of Lincoln, being of opinion that the technical education of plumbers is essential to the preservation of public health, desires to express its hearty satisfaction at learning that the Corporation of Lincoln have given encouragement and financial aid to secure the establishment in Lincoln of a class of instruction for plumbers in conjunction with the Worshipful Company of Plumbers, London; and the meeting further desires to direct the attention of the Members of Parliament for Lincolnshire to the bill now before Parliament for regulating the qualification of plumbers and securing the national registration of qualified men." The resolution was seconded by Mr. E. F. Arnold, master plumber, and supported by Mr. W. Watkins, F.R.I.B.A., the well-known sanitarian, who invited the interest of the citizens on behalf of the plumbing portion of the Technical School, pointing out that the plumbers had done more than any

other body of craftsmen to promote technical education. The resolution was carried unanimously.

**FUNERAL REFORM ASSOCIATION.**—A meeting of this Association, open to all who desired to attend, was held in the Church House, Westminster, on Thursday, the 3rd ultimo, the Bishop of Marlborough in the chair. The discussion was upon subjects connected with funeral reform, such as the desirability of using perishable, in the place of durable, coffins, and the abolition of unnecessary expense in conducting funerals, and in various mourning customs.

**PUBLIC HEALTH IN PARLIAMENT** does not seem likely to assume much prominence during the present Session, but not a word concerning sanitary matters is to be found in the Queen's Speech. Yet, a Conservative predecessor in office of the present Prime Minister (Disraeli) once uttered the significant words, "The first consideration of a Minister should be the health of the people."

**THE PROTECTIONIST TARIFF** lately adopted in France is already beginning to cause great uneasiness. Food of every kind has considerably increased in cost, and Mons. Lafargue, deputy for Lille, has brought forward a motion in the French Chamber for the repeal of the tariff so far as it affected food-stuffs. The motion was defeated, but popular agitation must soon lead to some modification in this respect.

**PASTURE LAND** is fast taking the place of arable land in Great Britain. Only twenty years ago the proportion of pasture to ploughed land was but as two acres to three acres; now they are in equal proportion. At the present time the corn crops of this country are less in area by one million acres than was their extent only ten years ago, wheat representing three-fourths of this enormous relative diminution. Coincidental with this decrease in the cultivation of cereals may be noted the increase of our flocks and herds; the number of sheep being twenty-nine millions, or one million and a half more than in 1890 and four millions more than in 1881—a remarkable fact when we take into account the vast importations of meat and live stock from abroad.

**A HINT TO FOOD INSPECTORS—ADULTERATION AT LIVERPOOL.**—We learn from Liverpool that out of eighty-six samples of milk purchased on week-days by the officers appointed for the purpose of detecting adulterations nine were found to be adulterated; while out of twenty-five samples purchased on Sundays, five proved to have been tampered with, showing nearly twice as large a proportion of adulterations on Sundays as compared with week-days. Evidently the Liverpool dairymen feel that they must draw the line somewhere in interpreting "no manner of work" in the injunction for keeping holy the Sabbath; and they define the phrase to mean that they must not milk the cow, though they may turn on the water-tap. Condensed milk is gradually deteriorating, judging by the results of analyses at Liverpool as well as elsewhere. A particularly bad sample bore the attractive label, "Specially prepared from the milk of cows pastured on the ever-fresh, green herbage of the Emerald Isle." More than half of the specimens of butter submitted to examination were found to be adulterated, viz., twenty-four samples out of forty-four.

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## ON THE SANITARY SIGNIFICANCE OF CHLORIDES AND NITRATES IN DRINKING WATERS.

By J. W. GATEHOUSE, F.I.C., Public Analyst  
for Wiltshire, Bath, &c.

As the whole subject of water analysis is a very wide and intricate one, I shall confine these remarks to two points of a practical character, which will readily enable sanitary inspectors\* by simple tests to determine as to the probable purity or impurity of a given sample of drinking water.

The solvent power of water is so great that absolutely pure water does not exist in nature. Rain water, collected near the surface of wide moors, contains some dissolved gaseous and solid impurities, washed out from the atmosphere, though, of course, to a very slight extent; but immediately the rain touches the soil, it dissolves any soluble substances it may come in contact with, and thus, in the substances contained in spring waters, we have a history, as it were, of the course of the water from the clouds to the spring.

The primary rocks, such as granite, are but little affected by the rain, so that waters collected in parts of Wales, Cumberland, and Cornwall contain as small a quantity as from two to

five grains of solid matter per gallon, whilst samples taken from the carbonate of lime districts contain from twenty to thirty grains per gallon, even when quite uncontaminated with substances injurious to health. But in all these cases where the water is uncontaminated with sewage, or its equivalent decomposing nitrogenous matters, the chlorine, as chlorides, and the nitric acid, as nitrates, will be found to be not more than from one to one and a half grain per gallon, and even in waters of second class quality these amounts do not exceed two grains per gallon. As a general rule it will be found that where the chlorine is over two grains per gallon, the nitric acid will also be higher than the average.

It will be noticed that I speak of nitric acid rather than of the nitrogen contained in the nitrates: the reason of this being, as will presently be shown, that the sanitary inspector can determine for himself, by a very simple method, the presence or absence of nitric acid, and, therefore, of nitrates, although he cannot determine its amount, as this latter operation can be performed only by a skilled analyst. Should anyone wish to translate the amount of nitrogen, as given in a water analysis, into nitric acid he has only to multiply that amount by  $4\frac{1}{2}$ ; of course, dividing the amount of nitric acid by the same figures will give the nitrogen.

In impure waters the amounts of chlorine and nitric acid will be found, as a rule, enor-

\* The lecture upon which this article is based was delivered at a general meeting of the Association of Sanitary Inspectors held at Bath.



mously higher than the average. In cases which have come within my own observation during the past six months, the chlorine ranged from 2·8 to 10·5, and the nitric acid from 4 to 28 grains per gallon.

Whence, then, do these excessively large proportions of chlorides and nitrates arise, for it must be remembered that to a given amount of chlorine or nitric acid must be added at least 40 per cent., in order to arrive at the actual amount of chlorides or nitrates in the water?

Leaky drains and percolation from cesspools must be held accountable for a large proportion of this contamination, and the remainder, especially in country districts, is traceable directly to the enforced dirty habits of the people who, owing to incomplete sanitary arrangements, are compelled to throw their slops and refuse on scraps of garden ground; most frequently in proximity to the well, or in such positions that the decomposing matters natural gravitate into the well. This they will do, under favouring circumstances, from a distance of fifty yards and more.

A special example of this fact has lately come under my own notice. The water taken from a certain well in a country district was condemned by me, in June last, as contaminated with sewage. The chlorine was 2·8 and the nitric acid 4·2 grains per gallon. The owner of the well thought it impossible that any source of contamination could possibly exist, but on careful examination, about fifty yards from the well there was discovered a cesspool which had, by accident, overflowed, instead of passing its contents into the proper channel. An alteration of the drainage provided a remedy; and an analysis of the water from the same well, in October, showed chlorine 0·98, and nitric acid 0·175 grains per gallon, whilst the total solids had diminished from 60·8 grains to 28·8. In this case the mischief was happily remedied by prompt action, as the overflow was of very recent date; but where the ground has become saturated with decomposing organic

matters, no amount of pumping or cleaning will remedy the evil, or remove the contamination, and the only safe course to adopt is to close the well.

It has been proved by direct experiment that, like many diseases, nitrates, when derived from decomposing organic matters, owe their existence to the presence of a minute microbe, without which the nitrogenous matters are converted into ammonia and similar compounds; but it requires the presence of this minute fungus to cause the decaying nitrogenous matters to absorb oxygen from the atmosphere and thus produce nitrates. A familiar illustration of the action thus resulting from the absorption of oxygen occurs in yeast, which, from similar absorption during its growth, produces carbonic acid and alcohol. It has been suggested by some persons that the oxidation of these organic matters into nitrates is a proof that they are thereby rendered innocuous; but that this cannot be the case is shown by the very conditions under which they are formed, for the disease-producing microbes, so prejudicial to health, are no more destroyed by oxidation\* than are the microbes which produce the oxidation and conversion of the nitrogenous organic matter into nitrates. These disease-producing microbes evidently flourish under such conditions, and the others are certainly not destroyed, but remain with the products of oxidation to contaminate the water into which they enter, and thus give rise to epidemic disorders.

The points already touched upon are undoubtedly more or less familiar to most of the readers of *HYGIENE*, but the special object of this paper is to show how easy it is for a sanitary inspector to arrive at a fairly correct opinion as to whether a given water is contaminated with sewage or not; the extent of this

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\* The bacilli of diphtheria and of tuberculosis flourish in parts of the body specially surrounded by oxygen, namely, the top of the throat and of the lungs.

contamination remaining for the skilled analyst to decide.

The detection of chlorides is very easy. Make a solution of nitrate of silver (lunar caustic), containing twenty grains per ounce, together with a few drops of pure nitric acid; if the water contains much chlorides, the addition of this solution to a glassful of it will make the fluid so turbid that it will become almost opaque, while it will render it only translucent, if the amount of chlorides is small. The addition of the nitric acid to the nitrate of silver solution is necessary because, otherwise, not only chlorides, but many other substances might possibly cause the turbid appearance just mentioned.

The nitrates may be readily detected by the aid of a somewhat uncommon, though not expensive, material called, diphenylamine. To use this, dissolve a little in pure strong sulphuric acid, and to a drachm of this solution, add half a drachm of the water to be tested. Any nitrates will turn the mixture quite blue, the tint varying to some extent with the amount of nitrates present. Should diphenylamine not be readily obtainable, a very fair substitute can be found in carbolic acid, which, however, produces a purplish tint, and not a blue colour, as is the case when diphenylamine is the test-agent employed. The analyst frequently uses a test for nitrates whereby the contamination is not only made evident to the eye, but becomes patent to the olfactory nerves. By shaking an impure water residue with mercury and sulphuric acid, a gas is obtained whose volume is not only an indicator of the amount of impurity, but which, on coming in contact with the air, at once shows by its colour and odour that there must be something very seriously the matter with a water capable of producing such disagreeable results. Could such an experiment be performed upon a badly contaminated specimen in a court of justice, no bench of magistrates would have the slightest hesitation in ordering the instant closure of the well from which it was derived.

## EPIDEMICS IN SCHOOLS.

By C. E. SHELLY, M.A., M.D., Cantab., Consulting Medical Officer to Haileybury College, etc.

*(Concluded from page 108.)*

CERTAIN checks exist to the introduction of infection into a school, and some of these are of the greatest value and importance. These checks comprise;—

1. An efficient system of "health certificates."\* Not only should the entrance certificate brought by each pupil to a school clearly indicate the several diseases from which he has already suffered, and his then existing state of health, but no pupil should be permitted to return to school after the holidays without bringing with him a certificate—signed by the parent or guardian—to the effect that he has not, for some specific period (say, three weeks at least) been exposed to infection. In the event of any pupil falling ill, or being exposed to infection during the holidays, notice should be at once given by the parents to the school authorities (*i.e.*, to the master or to the medical officer), who will, in reply, inform the parents of the course which they are to adopt, and at the same time furnish them with a form, to be signed by the parent and guardian and forwarded to the school the day before the pupil returns, to the effect that the several regulations laid down by the school have all been complied with. No pupil should ever be allowed to re-enter the school directly after such illness or exposure to infection; the pupil must proceed direct to the sanatorium (or infirmary) with his clothes, etc., where he (as well as the clothing) will be properly disinfected and examined by the medical officer before being passed into the school. "Disinfection at home"

\* Typical certificate forms for use in these and similar cases are given in the "Code of Rules for the Prevention of Infectious and Contagious Diseases in Schools," issued by the Medical Officers of Schools Associations. Third and revised edition. J. and A. Churchill, London.



cannot be relied on, and the invariable and impartial application of such a rule is essential to any effective system of hygienic precaution against the introduction of disease. It has been already shown that an increase in the average age of pupils markedly lessens the liability to epidemic outbreaks.

Even when an epidemic has been started there are certain regulations and conditions, the wise application of which can do much to impede its extension. First stands the immediate notification to the medical officer of every case of illness as it occurs: by this means some diseases (*e.g.*, scarlatina, chicken-pox) may be actually prevented from extending any further; and in the case of others much less possible to "stamp out" (*measles, e.g.*), the rate of progress can be much delayed by the same action which secures immediate attention to individual cases as they are recognised. But cases of illness must not only be immediately and effectively isolated from the presumably healthy for so long as they remain infectious; patients and their clothing, etc., must be properly disinfected before they are permitted to re-enter the school.

The attendance of day scholars acts, as has been seen, by affording opportunities for the more frequent introduction of infection, and for the consequent protection thus secured to those pupils who, in successive small batches, contract the diseases thus imported; the supply of susceptible material never, therefore, reaches a large proportion of the whole number of pupils, and its dilution by those already protected effects much in checking the progress of an epidemic disease already introduced.

The existence of separate masters' "houses" is also effective to this end; although the whole school constitutes a general community affording numerous opportunities for and channels of personal intercourse between its members, these "houses" are, to some extent, separate sub-communities; and their existence is found to have an appreciable effect in at least delaying

the progress of an epidemic through the large schools in which the system obtains.

Most important of all, probably, in the case of large schools at all events, is the subdivision into two distinct establishments; of which one—the junior school—contains pupils *up to* the age of about 12 years; the older pupils being drafted into the senior school. Most children tend to get through the list of ordinary infectious ailments by the age of about 15, with the single exception of scarlatina; but if associated during the earlier years of life with a large number of other young children, the opportunities for securing protection are greatly increased, and such a child will generally have completed his "course of epidemic inoculation" before the age of 13 at all events. Under such circumstances the senior school will comprise pupils who are practically not susceptible to the ordinary epidemics of school life, with the exception of scarlatina, and as this is a disease whose outbreaks are, or should be, almost always capable of immediate check and rigid limitation in a school, it follows that the much more serious and important work of the senior pupils is safeguarded against the disturbing interruptions of recurrent epidemics.

A study of the statistics at my command indicates—in the case of large schools with an entrance age of about 13 years, at all events—some interesting facts regarding the mutual relationship between different epidemic diseases, and the influence which they exert on one another when prevailing concurrently in a school.

Reference to the entrance statistics given in Table A, shows a curious equality between the number of boys already protected by measles and by whooping cough respectively; and this accordance is more marked for the later period, 1879-1887, during which time we may assume that the differentiation between measles on the one hand and Rôtheln and epidemic Roseola on the other, had become more general and precise. This near equality of the returns for pertussis

and for measles is, however, striking for all periods; it is, moreover, very equally maintained, not only throughout each of the 24 years noted in this table, but for each term during and subsequent to that period—as is demonstrated in the subjoined table, which embodies the returns made in a series of terms taken quite at haphazard.

TABLE B.

Terminal Returns for Measles and Whooping Cough.

| Total<br>Boys entered. | Total already<br>protected by<br>Measles. | Total already pro-<br>tected by<br>Whooping Cough. |
|------------------------|-------------------------------------------|----------------------------------------------------|
| 37... ..               | 29                                        | 23                                                 |
| 43... ..               | 30                                        | 32                                                 |
| 31... ..               | 25                                        | 20                                                 |
| 10... ..               | 9                                         | 10                                                 |
| 35... ..               | 29                                        | 29                                                 |
| 23... ..               | 19                                        | 16                                                 |
| 25... ..               | 20                                        | 13                                                 |
| 30... ..               | 23                                        | 22                                                 |
| 62... ..               | 50                                        | 46                                                 |
| 37... ..               | 25                                        | 25                                                 |

I am inclined to think, therefore, that for schoolboys of this age (13—14 *circa*) the entrance statistics of the one disease may serve as a useful check against those of the other; although epidemics of pertussis are relatively rare, and of but moderate dimensions when they do occur, amongst adolescents from about the age of puberty upwards.

Rötheln epidemics often precede or follow those of measles, but, as the two are *very* rarely coincident, adequate hospital accommodation provided for the latter disease will also serve for Rötheln. For, if Rötheln epidemics are apt to be more extensive than are those of measles, the period of convalescence is shorter, in the proportion of about two to three; so that, during an epidemic, beds are so much the sooner cleared and available for fresh Rötheln patients. Rötheln sometimes, but less commonly, follows in the wake of scarlatina; and during the progress of an epidemic it will sometimes be observed that Rötheln develops morphologically in two divergent directions; so that some cases come, on the one hand, more

and more closely to resemble scarlatina, and, on the other, to approximate to ordinary measles. But there is also another malady, still frequently confounded with German measles, under a common title of “Epidemic Roseola,” which is apt closely to resemble mild cases of measles; it is common about summer time, is highly infectious, and is usually a very trivial complaint, though a not infrequent cause of trouble to the school and of alarm to parents.

We still sometimes hear of a close connection between outbreaks of scarlatina and of diphtheria. I believe the alleged relationship, so far as it exists, to be accidental; greater precision in diagnosis has always led to more exact discrimination, and probably accounts, in no small degree, for the greater recorded prevalence of diphtheria during recent years.

Mumps is responsible for many and extensive epidemics before puberty. After the age of fourteen, or thereabouts, its incidence is much less regular, and—as a disease by itself—its epidemics are not often very large. But it would appear that if mumps occur coincidentally with measles, and so early in a school term as to allow the disease full scope, the number attacked may equal, or even exceed, that affected with measles; and a similar observation applies, though possibly with less force, to coincident epidemics of mumps and Rötheln. The fact that exhalation from the air passages is a mode of infection common to all three maladies may throw some light on this point.

Sir George Paget long since pointed out that a convalescent from typhoid fever is almost always susceptible to vaccination; that, in fact, the previously protected influence of this latter has been destroyed or neutralised by the more recent disease. This fact, seeing that youth is *par excellence* the period for enteric fever, may serve as an additional argument in favour of always performing re-vaccination at, or before, the termination of school life; for, during adolescence—the period of active tissue change



—the immunity conferred, at least temporarily, by the primary vaccination of infancy is apt to become exhausted in most cases; and at least 70 per cent. of the re-vaccinations performed at or towards the close of school life have proved, in my experience, successful. The returns given under the head of "Variola," in Table A, showing a decrease of 0.5 per cent. during recent years, is another proof of the increasing improvement in national health and health-seeking already alluded to.

As regards the hospital accommodation which should be provided for adequately dealing with outbreaks of epidemic illness in a large boarding school such as I have here been mainly considering—one, that is, containing 300 boys or more, the age at entrance averaging 13 to 13½ years, and that of leaving school 18 years—and allowing for two or more diseases being epidemic at the same time, we may conclude as follows: Beds should be provided to the extent of 2 per cent. of the *total* number of pupils, for dealing with *scarlatina*; 5 per cent. for mumps (and whooping cough); 2 per cent. for chicken pox—which (though readily taken by young children) does not give rise to extensive epidemics in schools of higher age, because, like *scarlatina*, early cases are easily recognised, and can, therefore, be promptly isolated before the malady has attained its most infectious stage; 1 per cent. say, for such a disease as diphtheria; and 10 per cent. for measles (and Rôtheln). It is often contended that it is both useless and unnecessary to provide special hospital accommodation for the two maladies last named. Yet each commonly induces a certain amount of physical debility, and is apt to predispose to other maladies; they seriously dislocate the work of the school; and each represents, for the patients attacked, a loss of educational opportunities at a time of life when they are most valuable. Thus, for example, an epidemic of measles affecting seventy boys involves, to them, a direct loss of at least 2,000 working days, and probably, by inter-

ference with the class work, not much less to their fellows. Baffling as measles is, the prompt and thorough isolation of each case as it arises at least limits the activity of so many foci of infection, and must, therefore, have an influence in curtailing the epidemic; moreover, it ensures to each patient that early and efficient treatment and continuous observation which constitute the best safeguard against the development of dangerous complications and troublesome sequelæ. Is it, then, anything short of criminal to do less than attempt, in every possible way, to separate the obviously infectious from the presumably healthy, and thus to secure for each class of those under our care the best advantages that we can command for them?

Under the average existing conditions, and seeing that the ratio of the unprotected for all diseases appears to be steadily and continuously rising, it would seem that hospital accommodation for infectious disease to the extent of 20 per cent. of the total number of pupils, is not excessive for the needs of a large boarding school prepared to do its duty to itself and to its pupils.

It is not requisite that the whole of this accommodation should be provided in a building constructed in the same permanent and substantial manner throughout; from one-half to one-third of the amount named may fairly be of a semi-temporary character, as *e.g.*, a semi-detached *annexe* built of wood or of corrugated iron with double walls; and this, during lesser outbreaks, would serve admirably as a play-room for convalescents. Further, the existence of what is known as the "house-system"\* in such a school tends at least to *delay* the progress of an epidemic, and may be considered to lessen the amount of sanatorium accommodation required by a number of beds equal to from 3 to 4 per cent. of the total pupils. Again, in the case of the

\* The several "houses" being distinct and isolated buildings.

attendance of a considerable proportion of day scholars, it may be taken that the amount of hospital accommodation required will be less than that needed if no day boys attended, by a number of beds equal to at least 2 per cent. of the total number of boarders in the school. Finally, whenever a large school is subdivided into a junior and a senior establishment, the latter is thereby greatly protected against the incidence of epidemic disease; and it is obvious that, if the senior and junior schools be conducted as distinct establishments, there will be a very great disproportion as regards the amount of sanatorium accommodation severally needed in the two cases. Separate accommodation should also be provided for servants: but, even in large schools, a total of two or three beds will suffice under this head. And it is essential to good results that the infectious hospital, or "sanatorium" buildings, should include an efficient disinfecting apparatus (large enough to deal with a full-size mattress), and a laundry in which infected clothing can be thoroughly dealt with, quite apart from the ordinary washing of the school.

It will not have escaped observation that the statistics of school illness at present available in this country are but fragmentary and incomplete. This is greatly to be regretted, for I am sure both that a mine of information of the most valuable kind lies here, only waiting to be worked, and that the elaboration and publication of such information can only redound ultimately to the great advantage of the schools themselves. The matter is at present engaging the attention of the Medical Officers of Schools Association, which hopes soon to be in a position to provide every medical officer of a school with simple schedule forms on which the most important facts in connection with the illnesses occurring amongst the pupils may be conveniently recorded. It cannot be doubted that the collation and study of such reports, extending over a series of years, and dealing with thousands of children, will prove of immense value, if only from the one

point of view of the study of epidemic illness amongst the young. And here it will not be out of place for me to acknowledge my own indebtedness to the governing body of the school with which I am especially connected. Some years since, when I was working at the school statistics of entrance and illness to see what they might teach, I asked whether any objection would be raised to my making public the facts at my command, should a suitable opportunity present itself for doing so. In reply, the council decided unanimously and without demur that, as the medical officer of the school, I was at liberty to make any use, public or private, of all such facts connected with the sickness, health, and other details of the school as came within my official purview—provided only that their publication seemed calculated for the benefit of the school itself or of the public at large. It has, indeed, been contended, and perhaps rightly so, that no school is entitled to the selfish monopoly of the scientific truths which its existence reveals; but not every corporate body is so prompt to see, and so ready to do its duty in such matters; and the votaries of hygiene, at all events, will be the last to withhold their approval of a course which is consonant with their teaching and in furtherance of their own endeavours.

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### THE CLAIMS OF NATURAL HISTORY.

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By DR. ALFRED J. H. CRESPI, Wimborne,  
formerly Editor of the *Sanitary Review*.

IN one of his most charming works, Kingsley, with his wonted exquisite felicity, dwelt upon the pleasure to be got from observing natural phenomena and collecting specimens which, from their beauty or rarity, were particularly interesting. Better to have a deep, scientific, systematic knowledge of a subject, no doubt; but when that is wanting, as from the very nature of things it must generally be, he showed how much could be done by patiently and intelligently looking about. Charles



Kingsley gives instances of working men, private soldiers, and military officers resident in tropical regions, who had, as the reward of untiring watching and recording, obtained an insight into the secrets of nature that enormously increased the pleasure of living; indeed, in one place he remarks that anyone who simply sets himself to notice natural phenomena — such as those connected with the weather, the movements of birds, plant life, or any class of insects — would almost certainly make discoveries of great utility to mankind. The study of natural history entered upon reverently and intelligently doubles the pleasures of life, and is worth many sermons on the goodness of God.

"Think you," says Herbert Spencer, "that a drop of water, which to the vulgar eye is but a drop of water, loses anything in the eye of a physicist, who knows that its elements are held together by a force which, if suddenly liberated, would produce a flash of lightning? Think you that what is carelessly looked upon by the uninitiated as a mere snowflake does not suggest higher associations to one who has seen through a microscope the wondrously varied and elegant forms of snow crystals? Think you that the rounded rock, marked with parallel scratches, calls up as much poetry in an ignorant mind as in the mind of a geologist, who knows that on this rock a glacier slid a million years ago? The truth is that those who have never entered upon scientific pursuits are blind to most of the poetry by which they are surrounded. Whoever has not in youth collected plants and insects knows not half the halo of interest which lanes and hedgerows can assume. Whoever has not sought for fossils has little idea of the poetical associations that surround the places where embedded treasures were found. Whoever at the seaside has not had a microscope and an aquarium has yet to learn what the highest pleasures of the seaside are."

Several years ago, when I first removed from Birmingham, I went to Exeter for six weeks.

It was the 28th of April, and in South Devon the trees were in full leaf, and summer was come, so that the contrast with the neighbourhood of my old home was very marked. I used to pass through St. David's several times a week in the evenings, along the Stoke Canon Road, across Cowley Bridge into the country; and this daily ramble was my sole exercise and change of occupation. To my right lay the richly-wooded heights, which charm the visitor approaching St. David's Station from Taunton and Barnstaple; and to my left stretched the beautiful fields and lovely woods of Upton Pynes, the park of the late Lord Iddesleigh, better known as Sir Stafford Northcote. The weather was, on the whole, excellent, and again and again I wandered on for hours enjoying in perfection the sunshine, soft air, refreshing verdure, and last, but not least, the ceaseless songs of the birds. Devonshire is not usually considered to be exceptionally rich in bird life, at least so naturalist friends tell me. The nightingale, rather an overrated bird in my opinion, never wanders across the Axe, and some other familiar songsters are not common; but, however this be, never in the course of a not very long, though varied enough, life have I heard such enchanting and continuous singing. After the busy strife of London, and the dingy skies and noisy streets of Birmingham, there was a charm, a peacefulness in those Devonshire rambles that I shall never forget. I seldom met with any other wanderer, and I often seemed for hours to have the country entirely to myself. Though I knew the country life of Warwickshire and Gloucestershire perfectly, that of Devon was a new experience, and as I listened to the rich notes of the blackbird and the throstle, the warble of the robin, the blackcap, the whitethroat, and the hedge accenter, the melodious trill of the skylark, and the clear ringing call of the cuckoo, I often fell to wondering what country life would be without its birds. Climates far more brilliant than ours are not difficult to find; lands where

the vegetation, the scenery as a whole, the mountains and the forests have marvellous attractions; but where can you find such verdant valleys and deep sunny lanes as in Devon, or on the Welsh borders, on one of those days, alas, so rare with us! when, as Lord Lytton remarks, "all is so calm and beautiful below, so blue and bright above," one of those English summer days with no equals elsewhere. I was once going to America, and in the train with me was a Mormon elder, a prosaic enough person, intent on money-getting and making converts; but when he spoke of English woodland scenery, the American, who had seen not a few lands and mixed with many strange people, became almost eloquent; his unprepossessing face lighted up, his dull eye brightened, and he poured forth a torrent of praise of scenes so beautiful and soothing, that he doubted if all the rest of the world contained anything equal to them. He, at any rate, had seen nothing like them, nor have I.

You cannot possibly study birds in a museum. No matter how admirably the little creatures have been stuffed, nor how close the adherence to natural form and bearing, the resemblance is really not closer than between a corpse, with its ghastly pallor and stillness, and a living, moving, thinking man. The only place in which to study birds is their native haunts, loving them as did St. Francis, knowing them as did Mrs. Shimmelpennick and Thomas Edwards. Animals soon get to know those who love and feel for them, and they remember their friends with a constancy rarely approached by human friendship. Look in proof of this at Sir Walter Scott's love for his dogs, and at their attachment to him; they were perfectly happy when he noticed them, and were content to wait long hours for the walk they so greatly enjoyed. Get the love of a dog and you may count upon it; it knows no falling off, no change. Once, after an absence of over two years, I paid a visit to a Berkshire house where I had twice resided for a time, and as I entered

the door a little dog, whom I had not seen all that time, sprang into my arms, uttering low, touching whinings of satisfaction.

Nearly thirty years ago I remember, as a very little child, hearing an account of a skylark, read from a magazine. The little creature had been carefully educated, and had become so intelligent, that his mistress could do almost anything with it. It came when called, delighted in being petted; played at games, and was quite one of the family. Birds far less interesting than skylarks sometimes show deep affection for their masters. Mrs. Olive Thorne Miller mentions a jay of which she had made a pet, and which seemed to understand everything she said. At her he never whistled nor screamed, but talked in low, gentle accents, slightly lifting and quivering his wings, getting as close to her as he could, and when she put her face down to him, touching her lips and cheeks gently with his beak. Anyone else in that position had a peck, so that he did not extend his affection indiscriminately. Sometimes when his mistress was busy she had to put him in his cage, as his persistent claims on her affection would have left her no leisure for anything beyond petting him. Shut up in his cage he would stand perfectly motionless for an hour at a time, intently watching her. The moment he heard her voice his whole manner changed: he came at once as near as he could and began talking in his bird fashion, holding his tail on one side, and spreading both wings to their fullest extent, and keeping them parallel with his back. In this position he would hop up and down his three perches always as near to his tenderly loved mistress as possible, and all the while in great excitement. If anyone else came into the room, during these manifestations of affection, he would drop his wings, but continue talking. When his mistress came close and answered him, his agitation became almost painful, and he relieved himself by pouring out gentle sounds, as though struggling for articulate words. Most birds can be



trained to show great affection, and they take to certain people in preference to others. But to get their love they must be treated with tenderness and gentleness, and talked to frequently almost as though human beings.

A writer, under the well-known signature of "Peter Lombard," in the *Church Times* of Jan. 9, 1891, gives a touching account of a country clergyman, who once heard some feeble flutterings as he was walking. Looking about him, he found that they came from a poor barn-door owl, which some brutal fellow had nailed, still alive, to a door. The horrified clergyman hurried to the spot and with great difficulty removed the nails, although the beak and claws of the owl made sad work with his hands. He then gave the poor bird some water; it drank it eagerly, looking at him with mingled feelings of surprise and pain. The clergyman took the bird home, and nursed and fed it till it was perfectly well; after that it seems to have been given full liberty, and it used to go in and out as it chose through the window. For years the singular pair remained close friends, the owl often perching on the back of its preserver's chair and caressing him; death at the end of a long attachment parted them, the owl going first.

In attempting to keep birds alive in winter some knowledge is needed. Many kinds cannot eat crumbs, but require some sort of animal food, and, for the benefit of these species, I quote a letter that appeared in the *Times* a few years back, signed "J. P. Nunn." It followed certain letters on the supply of food in the winter, and speaks for itself: "In the interest of little birds, may I add the word 'meat' to 'berries?' For some years in cold weather I have been in the habit of feeding little birds, and, in addition to their breakfast of bread and corn, I give them, as a standing dish, a joint or two of meat, which I hang in a tree, well out of the way of cats. The first supply of several pounds, which I hung up at the beginning of December, is now quite exhausted, nothing

being left but bone. New Zealand mutton is not dear at 2½d. per pound; but meat, as much to the taste of my feathered guests, may be had for half that price. I fear birds have more enemies than friends, but if only one friend in each parish would feed them in this way a great number would be saved from starvation in severe weather."

Often and often in other days I have sat looking upon the restless play of the sea round Lundy Island, when the birds had come in, and the great gulls and the Solan geese were darting like rays of light over the water below me, or soaring far above my head, and, though the delicious music of the Crediton and Exeter lanes did not fall in such rich variety on my ears, I watched with intense interest the huge birds absorbed in their occupation, and untiring in their activity, giving the landscape and the seascape, which would otherwise have been commonplace, a charm peculiarly its own. Few birds are more majestic than the Solan goose, which, in rapidly decreasing numbers, breeds on Lundy, the lowest latitude, I believe, where it makes its nest. As it sails along above the deep-green waters in resplendent sunshine it conveys a sense of tremendous power and of contempt for space and time that makes us feeble human beings envy him. Half an hour and those wonderful pinions would traverse the twenty-five miles between Lundy and Barnstaple; in an hour or a little more its tremendous strength would carry it to Cardiff or St. David's Cathedral. It is its own express train, and calm or stormy, dark or clear, its rapidity of flight and its contempt for distance never desert it. Birds are peculiarly interesting because they give life and music to the country; just that subdued movement which even the loveliest scene needs to be perfect. Only think of the keenness of observation and the acute intelligence of birds. Watch them eating crumbs scattered outside a sitting-room window, and you must confess how charming are their gambols, how much character

their conduct discloses, while some observers credit them with instincts to which we possess nothing parallel. The fruit in Chili and other parts of South America is said to have been in 1887 left untouched by the birds, while the sheep and the cattle which were imprudent enough to feast upon it paid for their temerity with their lives. These facts rest upon the authority of the "Pacific Archives of Medicine and Surgery," and show that the instinct of birds with respect to the wholesomeness of fruit is, as Michelet remarks in his great work on ornithology, frequently an excellent guide to human beings. Possibly, though not yet proved, the peculiarities in the fruits of different years may have something to do with the outbreak and varying mortality of cholera epidemics.

Sir Arthur Helps, gentlest and tenderest of men, in his own inimitable fashion, speaks with rapture of the *susurrus*, as the Romans would have called it, the gentle movements of many gentle creatures, the principal charm of the woods in the warm, calm weather of early summer.

Many of us hardly understand how supremely happy and busy birds are. No human community is more actively employed; no man or woman goes to work with such merry voice and untroubled joy. No one ever watched rooks more curiously than Richard Jefferies, and in his charming work, "Wild Life in a Southern County," he described the innumerable vast winter trysts of these sable birds, their daily foraging journeys from their roosting places, the large armies following, each its appointed route, and leaving detachments at given spots, and regularly picking them up on their evening return home. Nothing in bird life is more interesting and remarkable than a rookery. Perhaps, however, sea-birds best repay careful observation, especially during the eggng season, for they allow closer approach. What amusing little creatures puffins are, with their brilliant colours and keen, wide-awake eyes. Among

their native rocks in June they are well worth seeing, and their strange antics are characteristic. Their indignation when disturbed is positively ludicrous, nor is the right good will soon forgotten with which they squeeze the finger of the unlucky wight venturesome enough to push them off the solitary dirty white egg which they hatch, deposited in some rude hole or under the shelter of a piece of fallen rock. The puffin is sometimes called a parrot by West Country folk, and though this is scientifically a misnomer, it is an instance of the superficial appropriateness of many popular names. The diablot of the West Indies must have habits similar to the puffin, and like that poor little creature, has suffered many things at the hands of his cruel destroyer, man. The diablot is a great black bird, sombre as charcoal, half raven, half parrot, which nests, as puffins do, in holes in the ground, spends the day in them, and flies down to the sea at night to fish for its food. These sable creatures once abounded and it was the favourite but most brutal amusement to hunt them and drag them out of their hiding places. Labat says that they are excellent eating, though their uncouth appearance and strange habits provoke a not unnatural prejudice against them. They have been driven from their old haunts, and are now confined, in greatly reduced numbers, to the inaccessible cliffs near the lofty peak, which will long perpetuate their curious name. Alas! for the poor puffin: should fashion ever make it the correct thing to hunt it with trained dogs, its days would be numbered, and our rocky headlands would lose one of their prettiest and quaintest inhabitants.

It is a sad thought that birds of prey—no doubt in the wise economy of nature—destroy enormous numbers of little songsters every year. It has been computed, though the accuracy of the calculation may not be above dispute, that 20,000 sparrow-hawks make their homes in the United Kingdom; and if these on the average, consume two little birds a day apiece,



14,000,000 are thus destroyed in a year. That we cannot help, but we can prevent the wanton and objectless destruction of these little messengers of good and peace. No fashion more hideous, more savouring of savage instincts and barbarous tastes, can be conceived than adorning the hat or fastening up the dress with dead birds. An exception to head dresses of feathers must be allowed. Ostrich plumes are most beautiful, and cannot be ridiculed as absurd; moreover, they are now produced solely for purposes of dress on the great ostrich farms of the Cape, and their use must pass without protest; but to pin on a goldfinch, a yellowhammer, a robin—though the last atrocity I have never seen—a chaffinch, or a green linnet, makes us wonder if we are more intelligent and refined than some Indian brave, decorating his neck with a string of the grizzly bear's formidable claws. I cannot help repeating and dwelling upon that great charm of bird life—its ceaseless movement. Watch any bird hopping across the lawn, mark its bright eye, observe its graceful attitudes and perfect symmetry of form; and then, when you have shot it, and put a stop for ever to the quick beating of its happy little heart, go up and look at the limp, tiny form, lying still and bleeding on the ground; the contrast is too painful to be dwelt upon. It is more appalling, because human life is so full of sorrow, than seeing some superbly proportioned, active man in the midst of his labours, and then soon after standing by his coffin, and gazing on the cold rigid face of death—all the hopes and fears of life over; the marvellous mechanism, the most perfect and complicated structure in the world, stopped for ever; and the spirit that gave beauty and interest to that glorious form and active mind gone forth alone on its last long journey—gone, we know not where. But man believes that for him there is a hereafter in a land where, though work will never cease, it will be less exhausting and distracting than here; a land where there will be rest—where,

in short, the toil-worn struggler will find that peace which the storm-tossed soul of Dante sought in vain on earth. The little bird has no such future; it may be that when its existence ends here, and its brilliant eye dims, and its warm heart is cold and still, its enjoyment is over for ever. Destroyed for the good of man, killed to supply necessary food—though of what value can tiny birds be as food?—less objection could be urged; but slaughtered to adorn the bonnets and hats of people, who in consequence make themselves hideous; who perchance have never seen the bird at home in his early summer happiness; who pay small heed to his interesting ways, and care nothing for his surroundings—that is, indeed, too much. There is a touching and well-known passage in Thomas de Quincey's works, in which he describes the death of a feeble little bird, and the not unnatural emotion which its last attempt to flutter and sing called forth. No wonder! And when we think of what the country owes to bird life, when I remember the delight which birds have often given me, the peace that their merry songs convey into the soul, I marvel that anyone calling himself civilized and refined can take pleasure in killing the winged messengers, which seem to belong more to Heaven than earth, and whose wholesale destruction would transform the melodious groves and lanes of England into something like the silent, uninteresting and unattractive wilds of Australia.

But birds are not the only animals full of life and character. Some years ago I bought some white rabbits, one of them soon showed such lively affection and intelligence that I used to bring him into the house; he quickly made himself thoroughly at home, and scampered up and down stairs greatly enjoying himself. He grew to a large size, and used to delight in sitting at the foot of the principal staircase of my house awaiting my return; callers were often astonished to see the huge creature comfortably nestled upon the stairs. His great

delight was in the evenings to sit on the sofa or to nestle before the fire. He showed wonderful keenness. He got to know the servant's step coming to put him to bed, and used to run away and hide, and then he kicked her with right good will. He died at last to my great regret of a cold, one bitter March.

A letter which I have taken from the *Salisbury and Winchester Journal* of December 24, 1890, will not be out of place here. It was headed "The Last of an Old Inhabitant." It came from the Palace Gardens, and was signed "F. Smith."

"It will, I am sure, interest your readers, especially those having a long knowledge of these gardens, to hear of the death from old age, on Friday last, 19th December, of that familiar figure, the garden pony known as 'Jenny,' and said to be of a Russian breed. About the year 1854, a pony being required to do the work of the Palace and Gardens was purchased by Bishop Hamilton, the age of which was then about eleven years. From that date till last October she was constantly employed here in mowing the lawns, carrying the hay, and doing other garden work; fulfilling her duties to the satisfaction of everyone, and becoming a favourite with all who knew her, and recognised as a permanent member of the staff. During her long service of about thirty-five years she has assisted in bringing in the luggage of three bishops, and in the families of each had made fast friends, whose never-failing inquiries after her welfare and comfort showed that her faithful services had not been forgotten. It would be interesting to know whether there are other authenticated instances of such longevity of forty-six years, and very possibly more. The life of a horse, says Cuvier, 'Animal Kingdom,' page 122, seldom extends beyond thirty years, and Bewick's 'Quadrupeds' puts it between twenty and thirty years."

Even cats often show a great deal of character and strong affection. I had two, which, having always been treated with kind-

ness and much talked to, seemed to understand everything said to them. The older is rather a stupid, undemonstrative tabby. I have had her seven years. She is gentleness itself, and does not resent having bones or anything else taken not only from her, but out of her very mouth. Some time ago she had three kittens, and she used to drag these little creatures—even after they became quite large—from their box to the room where I commonly sat, jumping up to the window-ledge and bringing them in through the open window. Her next family, a year later, included a coal-black little son, remarkable for the white tip to his tail. Over this little fellow she watched for many months with great pride, bringing him rabbits' feet and even her own food; her delight, when he was stroked and noticed, was very marked, and she would often pace up and down, looking on with undisguised satisfaction while he consumed or played with the dainty morsels she had found for him. But, alas, for maternal love! at last she felt that the time was come to discontinue these favours, and for several months she has ceased to regard him with affection; but though he is now a great fellow, as big as herself, he cannot help wondering why she has changed towards him, and though, at the risk of many a cuff, ventures near her. The white-tipped little fellow shows an affection very similar to that of a dog, answering with a hoarse croak when spoken to; he is always ready for a run round the garden or down to the gate, even following me some distance along the road, and showing great delight on my return.

Few pictures are more fascinating than the lifelong devotion of Gilbert White, of Selborne, to the winged denizens of that still secluded and little changed district. The closeness of his observation, and the accuracy of his generalisations and conclusions, have never been surpassed, while his graceful letters remain, and always must remain, among the treasures of the English language. Again, look at Waterton's life in the country, reading the



mysteries of nature, which none knew better than he how to interpret; or, lastly, Frank Buckland's passionate love for animal life. There was nothing coarse or mean in his reverent eyes in anything that had come from the hands of his Creator. Reptiles, birds, and insects were to him fellow-creatures, fellow-servants, fellow-worshippers. Then poor Thomas Edward, the humble Scotch naturalist of Low Shore, Banff! Who can refuse to sympathise in his self-sacrificing study of nature? Night after night, in that far northern latitude, watching the creatures which could not be approached by day, and lying for hours in a cramped position in order not to alarm the timid little things that centuries of oppression had taught to regard man as their bitterest foe. Does not that poor shoemaker's life teach a lesson of constancy and untiring industry that should redeem the study of Nature from some of the neglect with which it is regarded? The love of birds doubles the enjoyment of country life.

### BRITISH HEALTH RESORTS.\*

#### No. 19.—Malvern.

By WALTER TYRRELL, M.R.C.S., L.S.A.,  
Medical Officer of Health, Malvern District.

LONG before certain far-seeing enthusiasts established cure by water as a panacea for all human ailments, and filled Malvern to over-

flowing with a vast cloud of witnesses to their skill or their acumen, before Simon de Montfort encamped his troops on the Herefordshire Beacon prior to his last disastrous fight at Evesham, before even the holy Saint Wolstan scooped out his Hermitage on the hill side, and settled down as the first resident, Malvern had in one way or another a considerable reputation as a health resort. It is true that in those days its votaries were few in number, and consisted for the most part of the simple bucolics of the neighbourhood, who sought from its healing waters relief from their ailments, for in those days it is to be noted that it was always water which was best, and it was to its healing action that were attributed all these good results which were in reality due to pure air and equable temperature. Many a quaint rhyme and mediæval adage still point to the strong belief which formerly testified to the health-giving properties of this celebrated spot.

A stranger approaching Malvern from the east is at once struck by the boldness of its hill outline, and the steep, almost precipitous, front which overlooks the wide valley at its foot. Indeed, for natural beauty it can fairly challenge any similar resort in England; or even on the wider area of the Continent. Whether visited in spring, when the hillsides are clothing themselves in a "livelier emerald" and the yellow tufts are breaking from the furze, presently to blazon forth into sheets of golden blossom; or whether, later in the season, when we are glad to seek the friendly shelter of St. Anne's, or the Holy Well; or whether when, autumn past, the first wintry touch has tinged the oak woods with a sterner brown. Malvern is always beautiful—and not Malvern alone; the whole surrounding country is as full of interest as of beauty, and the botanist, the geologist, and the antiquarian can all find rich material for research and reflection.

It is, however, not on account of its natural beauty, or for its scientific or archaeological interest, that Malvern can lay the strongest

\* The object of this series is to direct attention to the merits of different British health resorts, too often overlooked and neglected by persons who are put to much expense, trouble, and loss of time, in visiting Continental spas, instead of availing themselves of facilities open to them in their own country. No. 1, Hastings and St. Leonards; No. 2, Cornwall; No. 3, Droitwich and its Brine Baths; No. 4, Swanage; No. 5, Isle of Man; No. 6, Lowestoft; No. 7, Llandrindod Wells; No. 8, Rostrevor (Ireland); No. 9, Cromer and Yarmouth (Norfolk), and Rye and Camber (Sussex); No. 10, Brighton; No. 11, The Undercliff (Isle of Wight); No. 12, Bournemouth, by Rev. R. A. Chudleigh; No. 13, The Climate and Surroundings of Bournemouth; No. 14, Yarmouth; No. 15, Dinsdale-on-Tees; No. 16, Ilfracombe; No. 17, Lyme Regis; No. 18, Leamington. Any single number can be had post free by remitting seven stamps.

claims to popular recognition. It is on account of certain qualities of air and climate which are, as I shall presently show, dependent on its peculiarly favourable position. The hills running nearly due north and south, and the town of Great Malvern being situate on the eastern slope of the range, at an elevation of about 500 feet, it follows that every ray of morning sun is poured on the sparsely covered syenitic rock at our back; this, like a large fire-brick, retains the heat during the day, and radiates it during the night, tempering the cold natural to the latter. It is thus that Malvern enjoys the dry equable climate which constitutes its chief value as a health resort; and it is also probably from this cause that Malvern never experiences any of the rapid alterations of thermometer to which other places are so liable. Nor, although we face the east directly, can Malvern be called a cold place; in severe weather the temperature is always from 10 to 12 degrees higher than that of the lower-lying towns in the valley. Again, it is only necessary to glance at the position of the town to recognise the great advantages which it derives from its situation. Lying directly on the slope of the hill, with no similar elevation in front to retain the cloud and moisture blowing over from the west and south-west, and with no river within four miles, the dryness of the air is not to be equalled. Now, in all those diseases originating in disordered function, and which are liable to be so greatly affected by sea air and relaxing climate, it is easy to understand the important influence which Malvern exercises; I may mention especially nervous affections and all gouty and rheumatic derangements, with their various complications and sequels.

Further, the beneficial action of Malvern air is never more manifest than in those forms of congestive disease of the lung which precede and induce the phthisical tendency; indeed, if we examine the death rate of Great Malvern, and compare it with those of other less favourably situated watering-places, we cannot fail to be

struck by the marked immunity which we enjoy from this class of pulmonary disorders. Thus, comparing Torquay with Great Malvern during three successive years, we find that the deaths per 1,000 from pleurisy, bronchitis, pneumonia, were as follows:—

|         |    |      |      |      |
|---------|----|------|------|------|
| Torquay | .. | 3.77 | 3.11 | 2.80 |
| Malvern | .. | 0.66 | 2.00 | 1.00 |

Again, there are many disorders, especially those which arise from long-continued residence in crowded towns, or the malarial atmosphere of low-lying districts, which are marked by great physical depression, often attended by a corresponding mental gloom. To the person who long in "populous city pent" seeks Malvern for a change, the dry bracing mountain air and exhilarating surroundings give an almost immediate relief; new and unknown energies are aroused within him, his sleep is more sound and refreshing, he walks with a more elastic step and ceases to feel fatigue, his appetite, formerly so sluggish, is restored to its old keenness, and life altogether wears a new and brighter aspect. It is especially with regard to its influence upon the more depressed forms of nervous derangement that I would remark upon the beneficial effects of a residence in Malvern. The changes which result even in limited periods are most marked, and are, I think, easily explainable. The influence of high altitudes on the spirits is well known, but when this is combined with other and very favourable circumstances, such as I have already mentioned, and which go to make up the total of Malvern surroundings, we need not be astonished when we note the undeniably strong influence which this climate exercises on patients suffering from mental depression, and the other outcomes of nervous exhaustion. In all such cases there will be found a more or less sluggish functional power of the internal organs. The battery, the brain, itself lowered in its dynamic force, supplies with feeble current the proper nerve supply to all organs which derive from it their vital force; in consequence of this the



economy of life is carried on under serious difficulties, digestion is impaired, and the function of the liver being imperfect, as a necessity elimination, or the separation of waste material from the body, is not efficiently carried on, and the acids and vitiated secretions being undischarged remain to poison the blood, and by their poisonous effects on the delicate tissues of the brain distort the mental processes, and cloud the mental mirror.

No doubt in all such cases there is a predisposing deficiency of nerve power, which not only induces the sluggish condition of function which we observe, but also permits the deranged state of blood so far to overwhelm the mental control as to give rise to depressions of varying degrees of intensity.

Now, in all these cases, and indeed in all those nervous disorders which have their origin in exhausted states of the nervous constitution, the first thing needful is to place your patient under the most favourable hygienic circumstances, to take care that the economy of life is carried on at as small an expenditure of vital force as possible, that he shall breathe the purest air, drink the purest water, eat the most nourishing food in properly regulated quantities, and that his surroundings generally shall be invigorating and cheerful, though quiet and unexciting.

Again, in many of these depressed forms of nervous disorder, we shall find that much benefit is to be derived from the use of that form of medical heterodoxy known as hydrotherapy. That this system of treatment contains most valuable aids to medicine no one can deny; the mistake which has been made has been to dissociate it from the ordinary system of medicine, and to endeavour to establish it as a panacea. In this respect Malvern offers the advantage of all the necessary appliances for carrying out a systematic plan of reactive treatment by means of water, bathing of every description being easily obtained.

Children, especially those of strumous con-

stitution, thrive wonderfully in Malvern, as is plainly testified by the large number of schools for either sex, which not only exist but flourish. The marked immunity from zymotic disease which admirable sanitary arrangements have procured for us, may to some extent account for this. It is highly important to bear in mind how much the future health and consequent happiness of our children may depend on the physical influences to which they are submitted before their constitution is formed; how many bad or defective points may be eradicated or repaired; how many unhealthy predispositions removed, and the old Roman standard of the "*Mens sana in corpore sano*" thoroughly established. The physical influences of early life are found not only in the body, but also in the mind.

All meteorological statistics, unless they extend over a very long period of time and embrace a wide observation of phenomena, must be more or less open to fallacy; but the evidence which Nature supplies in the forms of vegetable life with which she clothes more favoured spots, is of incontestable value. In Malvern the beauty and luxuriance of the growth of evergreens, many of them of a most delicate nature, are, I believe, unsurpassed, and form a positive proof of the mildness and equality of the climate.

In concluding this article I would briefly recapitulate some of my statements. My object has been to point out that Malvern, from the unrivalled advantages of its situation, possesses unequalled claims as a health resort; that the equability of its climate, the purity and invigorating properties of its air, and last, though not least, the exceptional purity of its water, afford natural aids to the treatment of disease which no other place in England can hope to rival.

To those who have no need to seek health by change or travel I would say, Try Malvern for a holiday trip, and they will, I feel sure, never regret having made the experiment.

## DEFECTIVE PERSONAL HYGIENE AS IT AFFECTS THE TEETH, IN INFANCY, CHILDHOOD, AND SCHOOL LIFE.

BY GEORGE CUNNINGHAM, M.A. (Cantab.),

D.M.D. (Harvard), L.D.S. England

(Concluded from page 112.)

SHORTLY after taking my degree at the Harvard University in 1876, I was called upon to act as dental officer for a short period in a school devoted to the training of some poor gutter-children near Boston, U.S.A., and never shall I forget my first visit to that school, and seeing the children turn out promptly after dinner to what we may term their usual tooth-brush parade. In that school they needed not my instruction, but only my professional services in repairing the small amount of caries, inevitable even amongst such well cared for mouths. My fee was paid out of the private contributions of the members of the committee, a highly intelligent body of men and women, who showed the appreciation of the services of their own family dentist in the best possible way, by caring for and treating the teeth of those poor children as if they belonged to members of their own family. Nor could I help contrasting this state of affairs with the miserable treatment I myself received when at school. In our dormitories there hung at the end of each bed a bag for the reception of the brush and comb, and I well remember, on its external aspect a long mysterious narrow pocket, evidently intended for the reception of the tooth-brush handle. During my residence of seven years in that school, I never saw within the walls of the institution a tooth-brush in one of these pockets, yet it was a rich institution, in fact so rich that it really did not know how best to spend its income. There was a dentist attached to the school, but my own experience, like that of the other boys, was ruthless extraction of our teeth when they ached. I have since learned that he received the munificent sum of £10 a year for his services in a school

of 180 boys, and I further know now that this skilled and scientific practitioner delegated his functions to the none too delicate hands of his pupils with a view to giving them practice. No attempt to prevent pain and suffering and the loss of valuable teeth by filling, no advice as to cleansing or caring for them, came within our ken. Better for me, at least better for my dental armature, had I been one of those gutter children at that American School than the successful scholar in that rich Foundation School. Better the intelligent care of that considerate lay committee than the ruthless indifference of that highly-qualified school dentist.

If I have seemed to dwell unduly on this question of oral hygiene, it is for a very simple reason. The economic aspect of any proposed measure of reform must always demand careful consideration, but it would be impossible for any body of school managers to assert with reason that any reform of school dental hygiene presents any serious economic difficulty. While the initiation of any reform rests with the authorities, it is the superintendents and the teachers who must be the active agents in its application. Teachers in schools where the children are resident cannot escape from their vicarious parental responsibility. They may, like parents, descant on the alleged impossibility of getting children to brush their teeth, forgetting that the regular cleansing of the mouth is as teachable as the washing of the face.

In the schools examined on behalf of the British Dental Association the mouths of all the scholars were certified as clean in one school only, the Church of England Home for Waifs and Strays, Marylebone Road. Here the excellent tooth-brush habits are encouraged by a system of good marks, which is sufficient proof that the result is due to a difference in the authorities rather than in the scholars.

One good and direct effect of our collective investigation has been the introduction of a



tooth-brush into some of the schools examined. That the mere supply of a tooth-brush is insufficient is proved by the return from a small better-class school in Cambridge, where the boys resided with their parents or guardians, and in every case acknowledged their possession of a tooth-brush. Not a single mouth could be registered as clean: all dirty, and a few very dirty. Inquiries as to when they used it elicited such replies as "on Sundays," "twice a week," "occasionally," "when I go out to tea," etc.

The authorities thanked me for calling attention to this condition of affairs, and announced their intention of having it remedied.

We must now consider as briefly as possible the necessity for remedial treatment for this disease, which is so characteristic of all the periods of school life from infancy onwards.

As the temporary teeth have already been alluded to, let us now consider the principal features of the British Dental Association investigation. A very small percentage of children have mouths free from caries, and a still smaller percentage not requiring dental treatment of any kind. In the schools generally it is found that the ratio of children with sound permanent dentures fully completed as respects age is only 10 per cent. Some of these present irregularities are dirty, or are marred by the presence of persisting roots of the deciduous teeth. In a large number of cases the cavities are few, and in such a condition that a short and almost painless operation would save the teeth for years, and in some cases for life, were proper hygienic care bestowed upon them. Indeed, such teeth, where the decay had been removed and the cavity filled, would actually be in a better condition than when erupted, as all such early carious cavities are dependent upon structural defects, such as pits and grooves in the enamel. This latter fact is further illustrated by the tendency of the corresponding teeth on each side of the mouth which are developed at the same time to become carious. Despite such inherent defects, teeth often have

a high co-efficient of resistance, so that decay soon after eruption is no sign that the teeth must inevitably be lost.

In another series of cases we shall find many cavities, but still in an initial stage, in which, besides the pits and fissures, we find the approximal surfaces attacked, mainly in front teeth. In yet another series we shall find from the rapid development of caries that a few teeth are already too far gone for any treatment, otherwise than by extraction; such a condition may be found even within a few months after eruption. Still, these cases are only advanced stages of cavities, which were once in the incipient stage, and therefore once savable.

In a very small percentage of cases, about 10 per cent. at most, we find a large number of cavities in an advanced stage. In such cases any remedial treatment will have to be renewed again and again, as no process of filling can affect the low co-efficient of resistance, though diet, outdoor exercise, and use of the teeth may improve their quality as age advances.

In quite a number of cases the labial surfaces of the teeth are found to be seriously affected, not so much by cavities as by surfaces of decay extending over the enamel; such a condition is entirely owing to habitual uncleanness, as the teeth are often covered with a thick coating of a pasty, starchy mass of food debris. If the decay has not extended beyond the enamel, thorough cleansing and polishing of the enamel may arrest the mischief.

The tooth most frequently affected with caries is the first molar which is erupted during the fifth, sixth, or seventh year. It is too frequently regarded, or rather neglected, as belonging to the temporary dentition. The first permanent, or so-called sixth year molars, are the largest teeth in the mouth, and therefore play a very important part in mastication. Indeed, for the six years intervening between the eruption of the first and second permanent molars, it forms the only masticating surface, which is continuous during the transformation of the tem-

porary into the permanent dentition. They have no successors, and should not be allowed to become extensively decayed; even if they cannot be permanently saved there are good reasons, with reference to the preservation of the integrity of the arch and to the requisite growth of the jaws, why they should be retained until the second molars (twelfth year) are erupted or erupting. Statistics show that the lower molars begin to erupt soon after the age of five years, and except in a few cases are complete in about two years. The upper molar is very slightly later in its appearance, follows much the same course of eruption. About six and a quarter years, where the dentitions were bad, roughly two-fifths of the 50 per cent. and a year later more than a half of molars erupted were decayed, or already lost. As age advances the proportion of caries inevitably advances higher and higher.

The economical aspect of treatment at this age is of the highest importance, for caries is essentially a disease of youth, from its dependence on predisposing causes which diminish as age advances. Most weak points in structure, pits, depressions, and proximal surfaces, will have been attacked before the age of 17 or 18, and almost all of those which will even succumb by the age of 25 years. Further, a cavity of decay in the proximal surface of one tooth usually leads to its neighbour becoming affected, and thus far caries is an infectious disease. Even in bad cases if the caries can be eradicated and excluded for a time, its control becomes fairly easy if the patient performs rigorously his share of the preventive work.

It has been found that if certain teeth must be extracted, the best time for the operation is between the eleventh and the thirteenth year, and to effect this a considerable number of the molars must be temporarily filled.

Treatment during school life directed to the amelioration of any irregularity of the teeth must result in diminishing the number of carious cavities by the removal of a not infrequent predisposing cause. Moreover, in many cases

where the position of the teeth is quite regular, it is found that the extraction of four teeth, most frequently the first molars, or more rarely either of the bicuspid, is, in its final effect, more truly conservative treatment than their retention by resort to pure restorative operations.

The greater the likelihood of the individual being unable to procure the alternative restorative treatment in later life, the greater is the necessity for applying the remedial radical treatment technically termed symmetrical extraction. This operation to be most successful should be performed from the eleventh to the thirteenth year, according to the eruption of the teeth. If it is deferred to a later age than the fifteenth or sixteenth year, there is great uncertainty as to the final results. The subsequent movement of the teeth which results from judiciously applied symmetrical extraction is such that even an expert may doubt in later years as to whether the first molars have been extracted or not, whereas the functional value of the denture as a masticating organ may be ruined by the indiscriminate extraction of the same number of teeth.

To ignore the abnormal or diseased conditions of the teeth during this period (from the sixth to the sixteenth year), even if they are unaccompanied by pain, will inevitably lead to a partial, if not a complete wreckage of the entire denture as a masticating apparatus, earlier or later, in the third period of the individual's life history. There can be no question that from the trifling attention, and often from the entire lack of attention, paid to the teeth during this important period of eruption, a very large number of patients are doomed to pass through the third and major portion of their lives maimed and crippled so far as their jaws are concerned, or obliged to put up with the relatively poor comfort and frequent discomfort of artificial substitutes. The lack of the watchful care of a thoroughly qualified dental practitioner, especially during the first half of the eruptive



period, frequently entails resort to the cumbersome, the discomforting, and the expensive mechanical appliances for the correction of irregularities which might have been easily avoided.

During the past ten years I have had an opportunity of acquiring a pretty thorough knowledge of the average condition of the teeth of the University undergraduate, and have seen the fearful destruction caused by dental caries in the mouths of those who may be taken as typical of all that is best so far as social condition, physique, and means can afford mitigation or relief of these conditions.

If we regard for a moment even the purely academic aspect of some of these cases, is it not a deplorable short-sightedness and a sense of false economy, which leads both the parent and the schoolmaster, by the neglect of attention to the dental organism during the eruptive period, to run the risk of a complete breakdown of the student on the eve of an important examination, through pain and suffering with his teeth? The period of the ordinary, and especially of the "trips" honours of the examination at Cambridge, is characterised by a notable increase in the number of acute cases calling for treatment, and I have known more than one case where the student's position in the class list was materially affected thereby. What is true of this section of the community must be also more or less true of others. An intelligent student somewhat surprised me the other day by asking why it was the parent and schoolmaster were generally so particular as to the quality and sufficiency of the food at school, and so utterly disregardful as to whether the boys had or had not an efficient dental mechanism for the mastication of that food. Of course my only reply could be that it was in consequence of their utter ignorance of the importance and the advantages, both economic, and, as I am also convinced, educational, derivable from adequate attention to the teeth of the school children.

Without dwelling on the prevalent neglect of the teeth during early life, and the great amount of severe pain, loss of teeth, and consequent incapacity for complete mastication—entailing indigestion and other serious maladies—to which that neglect leads, I should like to refer to the evidence of Mr. Bennett Williams, who kindly afforded me the opportunity of giving my first public lecture on "Preventive Dentistry" to several hundred parents of children attending a board school in one of the poorest districts of North London, more especially as he called attention to an interesting fact, namely, that a defective condition of the teeth may seriously impair their function as a part of the mechanism of speech. He states that his experience as the head master of one of the largest London board schools, and the exceptional opportunities he has had for over a quarter of a century of noting the various changes in the health of the children of our working classes, convinced him that more sickness than is generally supposed is directly traceable to neglected and defective teeth. He has further observed that many cases of imperfect articulation, sometimes unhappily becoming a life-long habit, are due to the same cause. He thought that the lecture clearly proved that a good deal of the evil is easily preventable, and that the knowledge of a few simple truths, coupled with a little timely attention on the part of the parents, could not fail to be of the utmost importance to the well-being of the children; and if the very necessary and valuable information which was imparted by the illustrated lecture could be more widely known, and if increased facilities could be afforded to the poor for securing skilled attention in cases of special difficulty, he believed that great national benefit would result.

As a contrast to this, so far as the class of the patient is concerned, and as typical of the condition where individuals might have been expected to have fully availed themselves of the

advantages of modern conservative dentistry, I would quote the evidence of a distinguished tutor at Trinity College, Cambridge. He advises his pupils to have their teeth put thoroughly in order, as he has found so many of them break down at examination time from acute pain. These cases are always of the third or fourth degree of caries, and therefore of long standing, and involving disease of the pulp or the pericementum.\*

In the course of tabulating the British Dental Association's statistics I was prompted to place the returns of filled teeth amongst the "accidents," for the very simple reason that I had before me the condition of about 2,000 mouths and only two teeth returned as having been filled. Out of about 40 schools examined, I found only one to which a dentist has been appointed, and compensated in such a manner that his professional service was not confined to merely extracting teeth. This school is the Metropolitan and City Police Orphanage at Twickenham. A careful perusal of the report of the board of managers for the year 1890, shows that this institution is very largely supported by the contributions of the various police divisions. The dental surgeon's report is instructive, and the result of the statistical inquiry for the association is a very satisfactory proof of the utility of qualified professional skill. Under all the heads of inquiry this school contrasts very favourably with the others. In fact, it headed the list of those having the lowest number of teeth requiring attention, as related to sex and average age. The number of boys examined was too small for comparison with other schools. The number of girls (84) is sufficient to give average results. The lowest age was 8, and the highest age was 15, and the average age was 12 years and 8½ months. The number of temporary teeth requiring filling was eight, and the number requiring extraction was 31. The

number of permanent teeth requiring filling was 31, the number of teeth lost was 19, and the number of teeth demanding extraction was 49. The number of teeth filled was 67, a figure which is quite unique in our investigation so far. In estimating the number of teeth which had been attacked with caries, it was necessary to correct the total of teeth requiring attention, and the ratio was thus raised from 118 per cent. requiring attention to 197 per cent. originally defective, thus showing that the number had been reduced by 80 per cent. The dental surgeon attached to this school may well be proud of this achievement, as it represents an expenditure of professional time for which, in my opinion, he is only partially remunerated by his annual salary of £20.

The managers of the North Surrey District School at Anerley appointed a qualified dental surgeon some years ago. The dental surgeon attends one morning in each week, the school directors supplying instruments and materials, and giving a salary of £60 a year. As there are 850 boys and girls between the ages of 3 and 16, I believe the remuneration is insufficient if the work be efficiently performed.

In a few other schools, appointments have been made with satisfactory results, except where the amount of remuneration is so inadequate that only extractions are done.

It is not creditable that even the poorest children should continue to be subjected to a cruel operation which it is perfectly evident might be avoided in a very large proportion of cases.

The following report in connection with the Dundee Industrial School, containing 200 boys and 85 girls, from Mr. Fisher's case book, is more to the point. These are the words of the report: "Toothache seems the great, and almost the only, trouble in the schools. The housekeeper said that if they had a dentist they could dispense with the services of the physician; as yet they have no dental attention beyond an occasional extraction when a child is

\* Pulp: the so-called "nerve" of the tooth. Pericementum: the membrane surrounding the root of a tooth.



suffering from acute pain." Mr. Fisher has also shown the economic aspect of this question, especially as related to industrial schools, by showing that to continue neglecting the teeth of these children—when they are at the age that the maximum of benefit may be attained with the minimum of work—seems to be something like our Legislature continuing a vice against itself, as the very boys the Home Office endeavours so well to develop physically strong, and on whom the Treasury spends so much, are ignored by the Admiralty if they have the misfortune to be in the possession of a few bad teeth, when it is scarcely possible for it to be otherwise, as they do not receive the attention and treatment requisite for sustaining the masticatory powers, and thus their physique is seriously impaired.

With regard to the better-class schools, and especially those where the pupils are not resident, I would suggest the appointment of a dental officer, not necessarily to supply professional services to the pupils, unless the parents had failed to have the teeth attended to by their own dentist. Nothing should be done to interfere with the rights of the parents to consult the dental practitioner in whom they have most confidence.

An alternative plan which is already adopted by some, in this respect, intelligent schools, is that a certificate from some reputable practitioner that the teeth are in order should be required on entering the school, and also on the return from each vacation. Autocratic as such a suggestion may sound, it is justifiable, for our contention is that just as children suffering from other diseases are declined until restored to health, so those suffering from dental diseases should be refused as unfit for scholastic work.

USEFUL INFORMATION (?).—Under this heading a contemporary says that a man intoxicated with wine or beer generally falls on his side; if with whiskey, on his face; and if with cider or perry, on his back—which, put another way, means that a man having the good sense not to be intoxicated with any of these, would stand erect, as Nature destined him to do.

## DIETETIC THERAPEUTICS.

### A CASE OF SEVERE SPASM OF THE GLOTTIS SUCCESSFULLY TREATED WITH KEPLER EXTRACT OF MALT.

IN the December issue of *HYGIENE* I mentioned a poor sufferer who, for three months, had been living almost entirely on Kepler Extract of Malt. The circumstances are so remarkable and rare that they call for fuller particulars. On February 17th, 1891, a poor man came to consult me professionally; he was a stranger to me. He had, he informed me, been ill for over six months, and unable to work. At first he could eat easily, but he soon found that anything dry or cold brought on severe cough and had to be ejected from the mouth. He was a slight, not very brilliant, man of middle size; his age was 40. He had always worked hard, and as far as I could ascertain he had been steady and strictly temperate. The causes of the disease were obscure, nor have I ever succeeded in forming any satisfactory opinion. I believe, however, that the spasm was due to irritation of the recurrent laryngeal nerves caused by the pressure of a tumour, probably aneurysm of the aorta. He had been wasting a good deal, and was getting rapidly thinner and weaker, while the slightest exposure to cold and damp made him lose his voice.

For several months I treated him as well as I could, and though the difficulty of feeding him became rapidly serious, I contrived with the help of milk, broth, and custard to retard the downward course of the case. But every month he certainly wasted, and he became feebler, while his capacity to take food rapidly diminished and his appetite became fanciful to a degree, so that when he had taken a single spoonful of something he could not take a second, nor could he return to the same thing for days. Now when a patient gets into this state the perplexities of the medical adviser and of the nurse become very great, the one object then being to get the patient to take a sufficiency

of food. Early in September I was obliged to tell the sufferer's wife that her husband could never recover, and that the end could not be far off. My patient could not sleep, eat, or drink; he was much troubled with bed sores, which no care could prevent. His bones were literally starting through the skin, while he was living, existing rather, on the smallest allowance of food which would keep him alive—in fact he seemed ready to die, and perhaps at times he rather resented the efforts made to prolong existence.

Just at this stage, and in spite of his protestations shown by signs, I insisted on his trying some Kepler Extract; not that I expected much real good from it—that is, I thought that it would simply be an additional string to one's bow, a food which he might take a few times before he tired of it as he had tired of fifty other things. Judge then of my astonishment when I found that he soon looked forward to his Kepler with a relish he had not felt for anything for many months—nay more, he took it six, eight, and ten times a day, sometimes by itself but more frequently with milk, custard, or broth—in short, not only could he take it easily, but it helped him to take a score of things for which he had been losing all relish. Month after month he lingered on, getting at times stronger and putting on a little flesh, while his complexion became clearer, and his most troublesome symptoms did not get more grave.

Nearly six months passed, when he suddenly had a very severe relapse, and I was hastily summoned. I found him gasping for breath, the saliva trickling from his mouth, and the countenance livid; he had an attack of spasm of the glottis of a most aggravated character. I at once saw that his state was one calling for prompt and decisive measures. Fortunately in the course of a day or two the spasm abated and he gradually improved. The question then was, What had brought the spasm on in all its original severity? and my enquiries were directed to clearing up the mystery. Then I learnt that he had finished all his Kepler Extract, and had

had none for a week. I could only conjecture that cutting off the supply had so reduced his strength that he was unable to resist his insidious complaint. A fresh and liberal supply of Kepler was obtained, and he began again taking it six or eight times a day, sometimes alone, but more often mixed with other food, which but for the Kepler he could not have swallowed. He is still living, still depending on Kepler, and not much worse than he was a year ago—a most remarkable instance of the supreme value of a food which he has found more useful than any other.

During the recent influenza epidemic I have prescribed Kepler Extract of Malt in many cases of convalescence, and always with excellent results. Not a single patient has refused to take it, while a large number have relished it more than any other food, and have rapidly improved after beginning to take it. Its use is not complicated by any disadvantage, and I have not known a case in which nausea, indigestion, or any other bad effect has occurred. As far as a rather large experience will enable me to judge, it is a food or a drug which can be taken at all ages and in all complaints, though it could not often happen that a case so remarkable as the one described in this article could occur. But the full value of Kepler in keeping alive the aged, and in feeding young children, is unfortunately not generally recognised yet.

A. J. H. CRESPI.

## PUBLIC HEALTH REPORTS.

SOUTHAMPTON URBAN SANITARY AUTHORITY; Medical Officer of Health, Dr. A. Wellesley Harris.—This district includes an area of 2,004 acres; enumerated population in 1891, 64,899, giving the density of population at 32.4 per acre; number of inhabited houses, 12,221. Speaking of the population of Southampton, which has more than doubled in the past fifty years, Dr. Harris mentions an interesting fact, showing the difficulty of arriving at an exact estimate in this respect. Of course, the rule



in estimating the population of a place is to ascertain the enumerated population at the two previous decennial periods, and to assume for the following ten years a corresponding ratio of increase or decrease as the case may have been. According to this mode of calculation, the population of the borough of Southampton was estimated in 1890 at 66,347, but the census of last year revealed the circumstance that in 1891 the number of inhabitants was then only 64,899. Consequently, evident errors arose in calculating the death-rate, &c., for 1890. Facts of this kind constitute powerful arguments in favour of the proposition to have a numerical census (a comparatively easy measure), taken every five years, leaving other statistics to be collected at a principal census, held every ten years, as has been the custom since the commencement of the present century. The borough of Southampton does not, however, show any general falling off as might be imagined from the fact referred to, for it has more than doubled during the past fifty years.

Death-rate in 1891, 18·35 per 1,000; birth-rate, 31·51. The latter rate had been steadily decreasing since 1883, when it amounted to 34·5 per 1,000, until 1890, when it was down to the low ratio of 27·86. The marriage-rate was higher during the twelve months ending last December 31st, than it had been for several years past, from which fact it may be reasonably deduced that the general prosperity of Southampton is on the increase.

The mortality returns for the borough amounted to 1191 deaths in the year 1891; 252 of these were children under one year of age, 426 were persons of sixty and upwards, while the other deaths, 517, were those of persons between the ages of one and sixty years. Zymotic, specific, or febrile diseases caused 54 deaths in 1891, as compared with 90 in 1890, when whooping-cough was fatally prevalent. Deaths from respiratory affections showed a marked diminution in the more recent of these periods, but the mortality from heart diseases

was greater. Deaths registered as due to violence, accident, or negligence were classified as follows: Burns, 7; fractures, 20; drowning, 8; suffocation, 11; various causes, 10, making a total of 61—nearly 1 in 20 of the whole number. This seems an alarming proportion until we take into account the circumstance that, like other seaport towns, Southampton has constantly in its midst a considerable shifting population, regular in nothing except its irregularities of living. As regards the infantile mortality, *i.e.*, deaths under one year of age during 1891, that showed the rate of 123·2 per 1,000 registered births; the mean rate throughout England and Wales being 149 per 1,000, so that Southampton is below the average in this respect, which fact Dr. Harris attributes to the absence of the prejudicial influences existing in large manufacturing towns. The majority of the deaths from zymotic diseases and phthisis were recorded in the poorer and more crowded parts of the borough, thus affording direct evidence of the deleterious results of overcrowding and concomitant insanitary conditions.

The number of admissions into the Southampton Fever Hospital were somewhat in excess of those in 1890; the majority were cases for which the patients or their friends were unable to contribute any sum towards their maintenance—a strong argument of itself in proof of the public utility of such institutions. Fever or small-pox (15 cases of which were under treatment during 1891: 1 death and 14 recoveries) are difficult maladies to deal with in the well-appointed, roomy houses of the wealthy; how much the more must be the risk of spreading, and the tendency to fatal results, in poor, ill-ventilated, over-crowded dwellings!

With reference to infectious diseases, Dr. Harris says that the Notification Act has proved of valuable assistance in facilitating the prompt adoption of precautionary measures for preventing the spread of infectious diseases. One of the many carefully-drawn-up tables in the Report shows that a total of 233 such cases

were notified during the year, including 99 of scarlet fever, 62 typhoid fever, 33 erysipelas, 20 diphtheria, and 15 small-pox. Of this total only 19 were fatal, chiefly typhoid cases. More of these cases occurred in children between five and ten years than in any other quinquennial age period.

A number of cases of over-crowding were brought under the notice of the authorities, and forthwith abated. One of these instances was particularly interesting with reference to the excellent working of the Infectious Diseases Notification Act. A case of scarlet fever was notified to the Southampton Medical Officer of Health, and, on a visit being made to the address given, it was found that two adults (the father and mother) and four children occupied a sleeping room having a total capacity of 700 cubic feet. Reckoning 300 feet as the minimum air space per adult permissible in a sleeping apartment, and half of that amount for a child, it will be seen that the accommodation was very deficient. Fortunately, the disease was in its first stage only, and the child affected was at once removed to the Fever Hospital; a rigid disinfecting and cleansing process was adopted, with the result that none of the other children suffered, although the case removed to the hospital turned out to be very severe in its character. During the past year Dr. Harris has made upwards of a thousand visits to houses tenanted by the working classes for the purpose of drawing up a special report on the insanitary dwellings of Southampton, to be presented independently of the Report now under notice. From what he states in the Report, many of these must be condemned as unfit for human habitation. Some of these places almost carry conviction of over-crowding in their names, such as Beehive Buildings and Cross Street Rookery. Common lodging-houses in Southampton are in much the same unsatisfactory condition as elsewhere. Of the 13 houses of this class registered by the authorities, with provision for

the letting of 286 beds, Dr. Harris reports, after a careful examination of them all, that he feels certain that if the Sanitary Committee were to visit them the majority of the houses would be unanimously condemned. Filthy, ill-ventilated rooms, over-crowding, indiscriminate intermixing of the sexes, deficient sanitary accommodation, even as regards provision for the personal ablutions of the lodgers, and similar offences against cleanliness and decency, afford ample support of the medical officer's charges against these houses (the registration of which, in face of the flagrant breaches of the law, is a mere farce), and will, we trust, lead to the Sanitary Committee's carrying into effect the excellent suggestion made by Dr. Harris, as to the desirability of establishing, at the municipal cost and under direct municipal control, a common lodging-house, where a small payment of 4d. to 6d. per night would render such an institution self-supporting.

The slaughter-houses in the borough of Southampton are 43 in number. The majority are situated in crowded districts, and in close proximity to dwelling-houses, circumstances which, taken in conjunction with numerous sanitary shortcomings, render it desirable in the public interest to erect a suitable public abattoir for the whole borough—moderate charges to butchers using this building would probably be sufficient to defray the charges of maintenance. An excellent abattoir exists at Birkenhead, and was recently described in the columns of *HYGIENE*. The Sanitary Committee of Southampton would do well in taking that institution as a model for one in their own borough.

The number of nuisances abated during 1891 was 1,340. The staff of inspectors consists of one chief and three assistants, one of these posts having been vacant, however, for a considerable period. Even if the staff were made up to four, it would be insufficient for a town with a population of 65,000, especially as the work of this department has doubled during the last two or three years by reason of



the many new duties imposed by recent Acts of Parliament.

*Lincoln Rural Sanitary Authority*; Medical Officer of Health, Dr. Charles Harrison.—Area, 154,901 acres. The population of this sparsely inhabited district at the census taken last year was 25,778, only 254 more than in 1871, although at the census of 1881 the number of inhabitants amounted to 27,199. Calculating in accordance with the usual intercensal ratio of increase, the population is consequently less by some three thousand than it might have been expected to be. This great variation from the estimated number carries out the remarks which were made upon a similar condition of things in the Southampton Urban District. Dr. Harrison does not give any special reason for this falling off, made more striking by the increase of nearly 1,700 between 1871 and 1881, and we suppose, therefore, that the decrease can be accounted for only by the fact that in the eastern counties, as in other parts of England, there is a steady migration of the rural population into the towns, for the natural increase of the population—viz., excess of births over deaths—during the last eighteen years is stated at 4,461. For the twelvemonths ending December 31st, 1891, the death-rate proper—viz., excluding the deaths which occurred in the County Asylum, situated in the district—was 18·6, rather higher than usual, and due to the prevalence of influenza and chest affections in the second quarter of the year. The infantile mortality for 1891 was at the rate of 161 per 1,000 births, the birth-rate being 26·1 per 1,000 of the population. The mortality from zymotic diseases was 1·27 per 1,000. No cases of small-pox have been reported during the year, and it is nearly ten years since this affection was prevalent in the Lincoln Union; but, having regard to the fact that small-pox is epidemic in various manufacturing districts, whence it might at any time be imported, Dr. Harrison advises the Sanitary Authority as to the best means of protection—by efficient vaccination

and more stringent enforcement of the vaccination laws; while he takes the opportunity to direct attention to the circumstance that there is no hospital or other convenient place of isolation in the district.

The principal epidemics in the past twelve months have been influenza, which caused 46 deaths, and scarlet fever, of which 287 cases were reported—fortunately of a mild type—so that the total number of deaths registered as due to this affection were only 4. Diarrhoea led to fatal results in no less than 13 cases, although summer diarrhoea was not prevalent last year. Typhoid fever also made its appearance in different villages, from which circumstance and the excessive rate of mortality from diarrhoea we are not surprised to learn that the water supply generally is not so satisfactory as it might be. The inadequacy, and very often the impurity, of the water supply in rural localities is surprising, when we take into consideration the great rainfall during many months of the year, and the comparative ease with which a sufficiency could be obtained and stored for drinking and culinary purposes in thinly-populated places or at isolated houses. Disraeli, who had some sound sanitary views—take, for example, his famous observation that “the first consideration of a Minister should be the health of the people”—used to insist that every agricultural labourer’s cottage should have a porch and a tank; the former to afford a grateful shelter in which the labourer could smoke his evening pipe and enjoy his well-earned rest after the heat and toil of the day; the latter (placed over the porch) for the reception and storage of a sufficient supply of pure, wholesome rain-water for dietetic purposes. But, though country gentlemen are ready enough to echo the political sentiments of their departed chief, they have not shown the same alacrity in following his practical advice as to the improvement of labourers’ dwellings. During the year 1891 the rainfall in the Lincoln rural district amounted to 27·5 inches, being 7 inches

more than in 1890, and 2 inches above the average. How much of Nature's bounteous supply was treasured up, how much was lost?

A table appended to Dr. Harrison's report shows the working of the Infectious Diseases (Notification) Act. In the course of the twelve months 385 cases were notified, as against 609 in the previous year. Of these 385, 329 were certified by the medical attendants only, although the Act requires notice to be sent by the head of the family as well as by the doctor. It is therefore evident that, in this district, as in many others, a portion of the Act has been allowed by the authorities to become practically inoperative.

Judging by the correspondence which has reached us upon this subject, it would seem that the general view is that the dual notification is a failure; that it would be sufficient to limit the notification to the doctor attending the case, except where no medical man has been called in, in which event the head of the family should be required, under a sufficiently heavy penalty to insure compliance with the Act, to give prompt notice of infectious disease to the sanitary authority.

*Epping Rural Sanitary District*; Area, 48,099 acres; population, 26,137; Medical Officer of Health, Dr. Trevor Fowler.—In a district where the population is so sparse that it barely averages one human being to two acres, it might reasonably be expected that there would be ample house accommodation for all the inhabitants, but a perusal of Dr. Fowler's report would soon undeceive anyone upon this point. Indeed, like the policeman's lot in the comic opera, that of the agricultural labourer is not always a happy one, and a very wide acquaintance with the social condition of most of our English counties has long since led us to the firm opinion that, in very many instances, the hovel of the tiller of the land is disgracefully inferior in construction, in accommodation, and in sanitary perfection, to the stables in which the employer keeps his horses and his

cattle. Take overcrowding, for instance. Who, at first thought, would expect to find instances of this, where the ratio of population to area was only one person to every two acres of ground? Yet, in the picturesque little village of Loughton, Dr. Fowler reports two blocks of houses, actually built on the back-to-back system, a principle so faulty that it has met with universal reprobation even in the densely-populated manufacturing towns of Lancashire and Yorkshire, where the necessity for the mill-hands living near to their work, might have been accepted, if not as an excuse, at any rate as a palliating circumstance. Dr. Fowler has properly condemned these and various other houses as unfit for habitation in different parts of his district. Is it possible that any of the members of the board can have found fault with Dr. Fowler's laudable energy in tracing and reporting upon insanitary conditions? Can anyone, in the spirit of Talleyrand, have uttered a warning against *trop de zèle*? One would almost think so, for, at page 14 of his report, Dr. Fowler says: "Before concluding this part of my report, it may be well if I remind your authority that, in making inspections of the district both systematically at certain periods, and at intervals as occasion may require, your medical officer of health is only fulfilling his duty as laid down by the Local Government Board's order." From what we know of Essex cottages, particularly in Dr. Fowler's district—our experience is not that of yesterday, but extends back nearly forty years—it is most desirable that there should be considerable improvement in their condition. There is another matter which demands serious attention, and that is the water supply, which is often bad, or, where fairly good, deficient in quantity. Dr. Fowler reports that twelve samples of water brought to him by the sanitary inspector for analysis were all impure. The reasons for selecting samples from these wells (all of them, by the way, surface wells) were either that they were



intended to supply new houses or were used for public pumps. The general sanitary inspection of the district has been very actively carried out, as is evidenced by the fact that the inspections and re-inspections during 1891 amounted to 1,080, involving a mass of correspondence, notices, certificates, &c. Like Dr. Harrison, whose report on the Lincoln rural district appears in our columns, Dr. Fowler has found dual notification of zymotic diseases a failure, for there were only seven such in the course of the whole year, although 76 notifications were received from medical men.

The birth-rate per 1,000 of the population was equal to 25·6 per annum; the death-rate from all causes 16·9 per 1,000, that from zymotic diseases amounting to 2·1 per 1,000.

## Analytical Reports.

**SOUTHAMPTON.**—Mr. J. Brierley, public analyst for this borough, reports that during the past year 56 samples of various articles were submitted for examination. This is below the usual amount of work done, in accordance with the Food and Drugs Act, the average having been about 90 for the whole period since the Act came into force (1875). Of the 56 samples reported upon 11 were found to be adulterated, viz.: 4 out of 25 samples of milk, 1 of skim milk, 1 of brandy, and 5 out of 9 of sweet spirits of nitre. In the last-named instance the article was asked for by the Inspector under its common appellation, and what the Inspector was supplied with was, or professed to be, the "spiritus etheris nitrosi" of the British Pharmacopœia. From the large proportion of cases in which an inferior article was sold, it is evident that our public analysts might usefully turn their attention occasionally to the bottles on the chemists' shelves. One chemist who was summoned for adulterating sweet spirits of nitre (the process adopted by him being "breaking down" with alcohol), advanced in extenuation of his offence the singular plea that the article was not sold but used for dispensing, and said that if a prescription were brought to him in which two drachms of "spiritus etheris nitrosi" were ordered, and he (the chemist) thought his spirit a little weak, he should put in three drachms.

THE METROPOLITAN ASYLUMS BOARD provide the following accommodation:—Leavesden, Caterham, and Darenth Asylums, and Darenth Schools, 6,654 beds; Fever Hospitals (six), 2,529 beds; Small-pox hospitals and hospital ships, 350 beds; Farm hospitals for convalescents, 800 beds; training ship "Exmouth," accommodation for 600 boys.

## Reviews and Notices of Books.

*Cocoa: All About It.* By "Historicus." Pp. 114. London: Sampson Low, Marston and Co. 1892.

UPON first consideration, it might seem to some of our readers that so much has been written and said concerning cocoa that any new book on this subject could hardly contain sufficient novelty to make it interesting. When they open the one under notice they will be agreeably surprised at the mass of information which it contains, and the clear manner in which this is arranged.

And, upon second consideration, it will probably occur to them, as it has done before now to ourselves, that many persons, even of education, have, if not an "open mind," at any rate a rather mixed one upon the matter. Not very long since, having made a present of some remarkably fine coco-nuts, commonly, but erroneously, designated cocoa-nuts, to some young people of our acquaintance, we were surprised and inwardly amused at hearing their mamma, one of those matrons who see an opportunity of imparting the rudiments of knowledge to their offspring on every occasion, give an object-lesson, in which the white kernel of the nuts and "the cocoa that you drink, my dears," were inextricably blended.

For this sort of ignorance the use of several words having the same sound, and almost the same orthography, is in some measure at fault. A few summers ago at Margate we noticed a party of "trippers" highly amused at reading a placard affixed to a street stall, announcing to the passers-by that its proprietor had "koker-nuts" on sale. But the poor fellow, with his chance shot at spelling, was not much more ignorant than his lively cockney critics would have shown themselves, had a few questions been put to them.

Briefly, coca, from which is obtained the

alkaloid cocaine, much employed as a local anæsthetic, is a plant growing in Peru (the *Erythroxylon coca*) and its leaves—the part of the plant used—possess the power of sustaining strength and diminishing fatigue during great bodily exertion, such as long marches. The cocoa-nut, or, as it should with more propriety be spelt, coco, as in the French language, is derived from a species of palm, the *Cocos nucifera*, found in abundance in many tropical countries. Cocoa is got from the seeds of the chocolate tree (*Theobroma cacao*), also a denizen of the tropics; it exists, both in a wild and cultivated condition, in Central America and the northern parts of South America. According to the author of “Cocoa: All About It,” the largest quantities of cacao are produced in Guayaquil, Para, and Bahia, the West Indies, Ceylon, and some portions of the continent of Africa. The famous Caracas kind comes from Venezuela.

Cacao, to which Linneus gave the distinctive title of *Theobroma* (from two Greek words, signifying “the food of the gods”), on account of its delicious flavour and nourishing properties, is an evergreen which grows to the height of from 15 to 30 feet, with very long, drooping,

bright green leaves, of oblong shape and pointed at the ends. The flowers and fruit which it bears at all seasons of the year spring from the trunk and thickest part of the boughs, with short stalks. The flowers, arranged in clusters, are small. The fruit, from 7 to 9 inches long and 3 to 4 inches broad, contains in each pod from 20 to 40 seeds, embedded in a soft, pinky-white pulp. There are several varieties of cacao, some red, others yellow, the latter having the preference amongst cultivators, partly on account of yielding a larger proportion of seeds than the other, partly because it is better adapted to cultivation.

Although cacao is in bearing more or less all the year round, the chief months for cropping are May and June, and October and November. The gathering is conducted by a number of men, who pick out the ripe pods, and remove them with the aid of a kind of cutlass, or of a hook with a cutting edge. Much care is requisite, otherwise the tree soon becomes practically valueless. The pods are collected into heaps, and subsequently broken, and the seeds drawn and sorted, so as to reject all black, unripe, or damaged beans. Next the process of fermenting in what is technically called the “sweating house” has to be gone through before the cacao beans are dried in the sun. Other processes, such as drying, roasting, and winnowing from the husks must be performed before the seeds are broken up into coarse fragments known as *nibs*. These nibs, from which cocoa and chocolate are prepared, contain 15 to 20 per cent. of albuminoids, and 50 per cent. of fatty matter—cocoa butter.

It was not until a period well into the seventeenth century that any writers commenced to refer to cacao and its valuable qualities; although Columbus is said to have brought samples home from the just discovered New World in 1494. When Cortez conquered Mexico in 1531, one of Montezuma's banquets is described as follows:—“They brought in amongst the dishes above fifty jars made of



FIG. 1.—Pod, Leaves, and Flower of the Cacao.  
Pod cut open, showing seeds, or beans.



cacao with its froth, and drank it, similar jars being served to the guards and attendants to the number of 2,000 at least." Prescott, in his "History of the Conquest of Peru," says that "the emperor took no other beverage than the chocalatl, a potation of chocolate flavoured with vanilla and other spices, and so prepared as to be reduced to a froth of the consistency of honey, which gradually dissolved in the mouth, and was taken cold. This beverage, if so it could be called, was served in golden goblets, with spoons of the same metal, or of tortoiseshell finely wrought." The author of *Cocoa* explains that "chocalatl," whence we get "chocolate," is a Mexican word, the pronounciation of which resembles the clattering sound produced when grinding the cacao and mixing it with sugar in the native handmill.

The earliest record of chocolate being used in England was in 1657, an announcement appearing in the *Public Advertiser* of that date, that "in Bishopsgate Street, in Queen's Head Alley, at a Frenchman's house, is an excellent West India drink called chocolate to be sold, where you may have it ready at any time, and also unmade at reasonable rates"; the price at this period being about seven shillings per pound, as we learn from Dr. Stubbe's book entitled, "The Indian Nectar, or a Discourse concerning Chocolate." Cocoa and chocolate made for many years but slow progress in public favour, and in 1831 the quantity consumed in this country did not exceed 500,000 lb. per annum. Since then it has risen by leaps and bounds up to more than 20,000,000 lb. in 1890. Seeing that tea is imported into England to the extent of 150,000,000 lb. annually, and that coffee is consumed to the amount of 100,000,000 lb. per annum, it certainly does seem strange that, as Dr. Crespi pointedly puts the facts in an article on this subject in *The Housewife*, only some few ounces per head of the population represent the consumption of cocoa, particularly when it is borne in mind that much of it goes into the manufacture of sweetmeats.

By the way, in *Cocoa: All about it*, a long extract is given from another article, also by Dr. Crespi, published in *HYGIENE*, October, 1899. The author of *Cocoa* speaks of *HYGIENE* as a "leading American publication." As our title is original, and our only shadow of claim to be spoken of as American is that *HYGIENE* has a fair number of subscribers on the other side of the Atlantic, we think it desirable to refer to this point, lest it might be supposed that we had copied the title of an American contemporary.

But what Dr. Crespi says in the extract referred to is of more importance, for it closely concerns every consumer of cocoa. He points out the large increase in the adulteration of cocoas, particularly those of foreign manufacture, which are too frequently adulterated with alkali; the result being that "this alkalisied cocoa has an appearance of strength which it does not possess, and the ignorant consumer hastily assumes that he is getting far more for his money and being supplied with a much better article, so that he cheerfully pays a higher price for his medicated beverage." Practically viewed, when an alkali and oil (like



FIG. 2.—Cocoa adulterated with common Arrowroot and Potato Starch, as seen by 1-5-inch power, and A eye-piece.

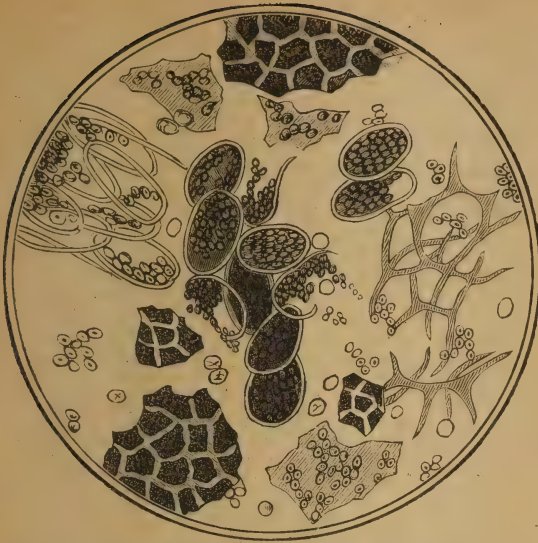


FIG. 3.—Pure decorticated Cocoa. Starch cells, inner membrane, and portions of embryo.

the cocoa butter) are mixed together, soap is the product; an excellent thing in the right place, but when substituted for genuine cocoa, a delusion and a fraud. The two illustrations which we give of pure and adulterated cocoa will enable anyone with a good microscope to detect admixture with common arrowroot, also, we regret to say, a frequent adulteration used by unscrupulous manufacturers. The best safeguard against adulteration is to exercise the simple precaution of purchasing only cocoas bearing the names of respectable English firms.

A special chapter on the manufacture of cocoa describes so fully the gigantic establishment of Messrs. Cadbury, at Bournville, near Birmingham, that the reader scarcely knows which to admire the most: the perfectness of the elaborate machinery (nearly one-third of the cocoa imported into England is cleared by this firm), the number of persons employed, or the arrangements made to insure their health and comfort.

A book on cocoa and chocolate would be incomplete without some mention of vanilla, which plays such a leading part in the manufacture of the latter, so that "Historicus" has done well in devoting a chapter to an account

of its distinctive properties, growth, and preparation for commercial use. The book is profusely illustrated, many of the illustrations being coloured, and we recommend it as readable, interesting, and abounding with useful information.

*Impediments of Speech: Stammering, Stuttering, Lispings, etc.* By W. Abbotts, M.D. Twelfth Edition. London: Beaumont and Co., 39, Southampton Street, Strand, W.C. 1892. Price 2s.

It seldom happens that a book upon a special subject, like the numerous forms of impeded speech which mar the happiness and blight the prospects of many thousands of people, passes into a twelfth edition; and this fact alone says more than a lengthy article would do as regards the book under notice.

The author, in his preface, points out the error of dealing with all cases alike, without due regard to cause, age, temperament, and other circumstances which must necessarily influence the nature and intensity of the affection; and throughout the work he inculcates the necessity of treating cases upon the rational principle of adapting the treatment to individual requirements.

## Correspondence.

To the Editor of HYGIENE.

SIR,—A copy of your publication for the current month has been handed to us. Under the heading of "A Hint to Food Inspectors," you remark that "Condensed milk is gradually deteriorating, judging by the results of analyses at Liverpool, as well as elsewhere." Your statement is correct so far as the quality of the condensed milk consumed in England, taken as a whole, is concerned; that is to say, in addition to a large quantity of thoroughly genuine condensed milk, an almost equally large quantity of condensed *skim* milk is sold. But we respectfully submit that it is not on this account right to cast a slur on condensed milk in general, our "Milkmaid" brand—the original "Swiss milk"—being of the same quality now as it always has been, and containing all the cream of the original milk. What is needful is that the public should be taught to discriminate between genuine



"condensed milk" and "condensed skim milk," and as the two products look and taste just the same, and the deficiency in cream can only be ascertained by chemical analysis, the law should compel manufacturers of condensed skim milk to so label it, and prohibit their using the word "milk" unless preceded by the qualifying term *skim* or *skimmed*.

In the meantime it might be well to call attention to the fact that a tin of genuine condensed milk, full cream and full weight, cannot be manufactured for less than 4d., and that consequently it cannot be retailed at 3d. or 3½d., as the skimmed article often is.

We send you samples of our "Milkmaid" condensed milk, Swiss and English, also of our preparations of coffee, cocoa, and chocolate with condensed milk, and shall be glad if you will test them. We do not think you will find much difference between the quality of the Swiss and English milk, though unfortunately the English public are so apt to give preference to foreign articles, on the supposition that they are better, that our English "Milkmaid" brand is not so popular here as it is, for instance, in the colonies.

Yours truly,

ANGLO-SWISS CONDENSED MILK COMPANY.

(A. J. Maas.)

10, Mark Lane, London, E.C.,

April 21st, 1892.

[We feel ourselves bound in justice to give prominent position to this communication, as some others may, like our correspondent, have misunderstood the drift of our remarks in last month's *HYGIENE*. As a matter of fact, we had in our mind the Anglo-Swiss and certain other brands of condensed milk at the time that we penned the paragraph in question; but we thought of them as patterns of the perfection to which that article should be brought, and we felt indignant that purchasers of so-called condensed milk, similar to the samples we spoke of, should be cruelly defrauded by people who, trading on the reputation that genuine condensed milk had obtained, foisted upon the public preparations inferior in quality and deficient in nutritive properties. We heartily concur with our correspondent as to the necessity of proper legislative protection against purveyors of adulterated foods. We are pleased to mention that our warning note has not passed unheeded, and that it has, as we know from letters which have reached us, put some of our readers—public analysts and others—upon the alert. With regard to the Anglo-Swiss preparations, we have examined them, not only at the recent request of our correspondent, but on various previous occasions, and we have always found them fully up to the standard of purity, of excellence, and of dietetic value.—Ed. *HYGIENE*.]

LOCAL GOVERNMENT BOARD. — Dr. R. Thorne Thorne has been appointed principal medical officer to the Board, in the place of Dr. George Buchanan, F.R.S., who has resigned, and upon whom the honour of knighthood has been conferred in recognition of his long and valuable services.

## Notes and News.

**CAVIARE.**—It is stated that the annual export from South Russia of this article of food, which is the preserved roe of the sturgeon, is upwards of a million pounds in weight. The greater part is shipped from Taganrog, and it is mostly sent to Greece, Italy, and Central Europe. The demand for it is comparatively small in England and France.

**IT MUST, INDEED, BE A HEALTHY PLACE!**—Some time back, we were travelling by rail to a well-known resort on the east coast. An elderly lady, one of the occupants of the carriage, was descanting freely upon its salubrity. "It must be a healthy place," she observed several times; "a London doctor has bought a house there for a family residence." "That's nothing," observed a gentleman, seated in the corner; "Why an eminent physician, Sir William Gull, was born within two or three miles of Clacton." "Then, it must, indeed, be a healthy place," the lady triumphantly observed, to the great amusement of her fellow-passengers.

**TOBACCO SMOKE** was for many years regarded as a powerful disinfectant, but of late this has been regarded as a fallacy. Mr. Tassinari's experiments bid fair to reinstate the vapour of the "noxious weed" in its original position. Smoke from a cigar was drawn over a piece of linen, which had been previously dipped into a fluid containing numerous microbes. Directly the fumigation had ceased, the linen was placed in a tube containing a liquid in which such germs could breed and multiply. The different micro-organisms thus experimented on included those of anthrax, cholera, and pneumonia; while similar check experiments were made, omitting the smoking. In every instance the effect of the tobacco smoke was to greatly delay the growth of the organisms, and in some cases it was wholly prevented. Where fumigation had not been resorted to, the ordinary course of growth and multiplication of the germs was observed.

## SPECIAL NOTICES.

**EDITORIAL.**—The next article of the "*Patent Medicines*" Series, No. 12, will appear in the June number. The Editor takes this opportunity to thank numerous correspondents for their kind co-operation and valued suggestions. He will always be pleased to receive articles, books, reports, and correspondence upon all matters coming within the scope of *HYGIENE*.

**PUBLISHING.**—*Reprint of "Patent Medicines,"* (first series). The third edition is now in the press, and will be published on May 5th. One hundred and twenty-eight pages, 1s., post free for 14 stamps. Purchasers of one dozen or upwards for private distribution, supplied at the reduced rate of 9s. per dozen. For contents, see Advertising Sheet.

# HYGIENE,

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## THE WATER SUPPLY OF TWELVE LARGE CITIES AND TOWNS IN GREAT BRITAIN AND IRELAND:—

ABERDEEN, BELFAST, BIRMINGHAM, BRIGHTON,  
CARDIFF, CROYDON, DUNDEE, GLASGOW,  
HUDDERSFIELD, LEEDS, LIVERPOOL, AND  
PRESTON.

It will be seen that the list heading this article comprises seven populous places in England, three in Scotland, one in Wales, and one in Ireland, the number of inhabitants ranging from about 100,000 up to more than half a million. They all possess the advantage of having a water supply under the control of the local authorities; as a consequence, they enjoy an abundant supply of pure water, thus presenting a marked contrast with the metropolis, which is dependent on eight private water companies, in whom the monopoly is vested, and who derive the greater part from two impure sources, the rivers Thames and Lea. "They manage these things better in France" used to be a common saying with persons desiring to emphasise the fact of our insular imperfections; "They manage these things better in the provinces" may truthfully be said when we compare the London Water Companies' supply—always dear, often dirty, and occasionally dangerous—with the plentiful and pure supply provided by the authorities of many provincial towns, from Glasgow and

Liverpool, each with a population exceeding half a million, down to small places like Andover, with 6,000 inhabitants, and Wallingford, with only 3,000.

In connection with the International Congress of Hygiene, held in London last August, numerous municipal bodies furnished short reports bearing upon local sanitation, and from these much may be learned concerning their water supply and other matters of hygienic interest. In the present article, we propose to deal with the first-named only, taking the cities and towns in alphabetical order.

*Aberdeen.*—Population in 1891, 112,923.—Until 1866 the water supply was derived from the river Dee, at a point barely a mile above the city. In that year this supply was wholly discontinued, and a much more abundant quantity was introduced by the Corporation, from the same river, upwards of 20 miles from Aberdeen (free from any probable sources of contamination). This water, passed through filter beds and storage reservoirs, is distributed to the greater part of the town by natural gravitation; the higher parts of Aberdeen being supplied from separate reservoirs to which the water is raised by steam-pumping. The amount consumed daily is about 60 gallons per head of the population. The water is of considerable natural purity, containing, on an average, about  $3\frac{1}{2}$  grains of total solids per gallon,  $\frac{1}{2}$  grain of chlorine, 0.1 part, per million



parts, of free ammonia, .04 part, per million parts, of albuminoid ammonia; the hardness scarcely exceeds  $1^{\circ}$ , so that it is well suited for both domestic and manufacturing purposes. The supply is upon the constant system; house cisterns for water for drinking purposes are not permitted in new houses, while they are rapidly being done away with in the older buildings. It may be mentioned, in passing, that the abundant supply of water has greatly improved the arrangements for the disposal of sewage.

*Belfast.*—Population, 255,896.—The water supply to this city is under the management of fifteen commissioners, chosen by the ratepayers, and elected periodically in the same manner as the members of the town council. Within the last fifty years the water commissioners have, on three occasions, erected new and more extensive works for the supply and storage of water, expending during the period mentioned £655,000. The total capacity of the storage reservoirs is nearly 2,400 million gallons. The quality of the water is very fair; it is principally obtained from upland pasture, and has a moderate degree of hardness. Filtration beds on a very large scale, and constructed on the most approved principles, are at present in course of erection in connection with the works, so that both for quantity and quality the water furnished to Belfast will bear favourable comparison with that supplied to other important industrial centres. The daily quantity delivered is equal to 34 gallons per head of the population.

*Birmingham.*—Population, 429,171.—In 1875 the Corporation acquired the water undertaking at a cost of £1,350,000. The supply is derived from the rivers Blythe and Bourne, Plant's Brook, Perry and Wilton Brook, and six wells sunk deeply into the sandstone rock. It is stored in numerous reservoirs, having a total capacity of more than 600,000,000 gallons, and thence distributed to the city and various adjacent places. The distribution area is about fifteen miles by twelve

miles, and the number of consumers is about 600,000. The average daily supply is nearly 16,000,000 gallons; at the time the works were taken over by the Corporation the daily supply was scarcely one-half of this quantity. A Bill is now before Parliament, having for its object the securing of a better and larger supply of water to Birmingham from Wales. We recollect, in our student days, that the Birmingham supply was so scanty and indifferent that in some localities it was a common sight to see men retailing "fine Digbeth water" (Digbeth being a part of old Birmingham) from water-carts driven through the streets. Anyone familiar with the Birmingham of that period would, if he had been long absent, fail to recognise the old town in the present altered surroundings.

*Brighton.*—Population, 115,606.—Those of our readers who perused Alderman Hallett's interesting account, published in *HYGIENE* last year (February number), of the persevering way in which the Brighton Corporation set about acquiring a good water supply for Brighton, will be prepared to learn that it is practically unlimited in quantity, while it is of the best quality. It is derived from borings and tunnellings extending from the bottom of deep wells sunk in the chalk down to the level of the subterranean water which is constantly passing through the chalk towards the sea. At the Goldstone Waterworks the shaft is about 150 feet deep, and the lateral tunnels run from this to a length of 2,600 feet, thus tapping the fissures of the chalk through which the water naturally filters. Brighton water is somewhat hard, similarly to all waters derived from the chalk strata. The temporary hardness is represented by 12.1 parts in 100,000, and permanent hardness by 7.3. This rather hard condition would be a drawback in water supplied to a manufacturing town, but, in a health resort like Brighton, it is rather an advantage than otherwise. The water is palatable and agreeable to drink, very fully aerated, and free

from all traces of organic matter. Before concluding our notes on Brighton, we should remark that the Corporation of that town was the first to accomplish the compulsory termination of a water company's career, and thus obtain for the ratepayers the full control and management of their water supply. This was in 1872: next came Birmingham in 1875.

*Cardiff.*—Population, 128,849.—Until 1850, Cardiff was dependent for its water supply upon various private and public wells. From that date up to 1879 the Cardiff Waterworks Company supplied the town from the river Ely and other streams in its immediate neighbourhood. In the last-named year the Cardiff Corporation obtained an Act of Parliament empowering them to purchase the whole of the then existing water undertaking from the company, the total amount paid to the company being £320,000. The very rapid growth of the town, owing to the extension of its docks, and to the prosperity and development of the coal and iron trades in the district, soon rendered it necessary to seek for new supplies, and a Bill was promoted in Parliament to obtain water from the Taff Fawr Valley in Brecknockshire, situate on the old red sandstone formation, about 30 miles from Cardiff. Although the Act was passed, and contracts for the necessary works were let in 1886, the town has not yet reaped the benefit of the wise and energetic action on the part of the municipality, owing to unforeseen circumstances in connection with the first storage reservoir, and to difficulties that have arisen with the contractors. It is, however, confidently expected that the works will be so far completed in the course of the present summer as to admit of a part of the new supply being distributed to the inhabitants of Cardiff. It is a recognised fact that in the Taff Fawr Valley Cardiff possesses one of the finest watersheds in the kingdom, with an almost inexhaustible supply of pure, soft water, admirably adapted to all domestic and manufacturing purposes.

As showing the superiority of the administration of water supply by local authorities, in place of a commercial company, the Corporation have so carefully studied the interests of the district that, notwithstanding the delays and difficulties referred to, ever since the Corporation took the matter into their own hands there has been an ample and constant service to all parts of the town, except for a short period during the summer of 1887, when it was found advisable to turn off the water for a few hours daily, so that the available water in store might be conserved as far as possible for any contingencies that might arise. The effect produced on the public health of the district by an improved water supply, amongst other public measures, is shown by the marked reduction of the annual death-rate. This was 327 per 10,000 (32·7 per 1,000) in the ten years ending in 1854; for the ten years ending in 1889, the annual death-rate was only 197 per 10,000 (19·7 per 1,000). The death-rate from infectious diseases was reduced from 98 to 31 per 10,000 in the corresponding periods. The reduction in the death-rate from typhoid fever, essentially a disease connected with bad and defective water supply, was most marked; it fell from 19 per 10,000 in the ten years ending in 1854 to 3 per 10,000 in the ten years terminating in 1889.

*Croydon.*—Population, 102,697.—The Local Board established waterworks by sinking a deep well into the chalk stratum in the valley of the Wandle, close by the town, which furnished an abundant supply of water. Duplicate pumping engines were erected on the site, for the purpose of raising the water into a large covered reservoir on Park Hill. Since then two other wells and two large pumping engines have been placed on the same site, and about 2,000,000 gallons are now usually derived daily from this source. In 1887 a new well was sunk in the valley south of Addington village, whence the water is forced into a capacious covered reservoir, erected on the top of Addington Hill, at a



sufficient altitude to supply the whole of the borough. With respect to its excellent water supply and other sanitary advantages, Croydon owes much to our esteemed contributor and friend, the late Dr. Alfred Carpenter.

*Dundee.*—Population, 155,433.—Like many old towns, Dundee has afforded during the past thirty years numerous proofs of the hygienic benefits derivable from improved sanitation. In 1871 the death-rate was 29·38 per 1,000; the latest official return of the Registrar-General placed the death-rate for the previous twelve months at 19 per 1,000. The water supply of the city, one of the ancient royal burghs of Scotland, is in the hands of the Corporation, who, by great efforts, and at an expenditure of £840,000, have provided an abundant supply. They first brought it from reservoirs constructed at Monikie, about 11 miles from Dundee; but the great increase of population and of the trade and manufactures of the city obliged them to considerably augment the supply. This they accomplished in 1871 by acquiring in perpetuity the Loch of Lintrathen, situated amongst the Grampian Hills. The loch comprised an area of 101 acres, with a right of watershed from 30 square miles, or 19,000 acres, of gathering ground. The Commissioners raised the loch banks, and increased the area to 405 acres, giving a storage of 1,601,000,000 gallons of water. The water is conveyed to Dundee, a distance of 23 miles, by two lines of cast-iron pipes (27-inch diameter,) and the quantity delivered daily to Dundee and its environs is between nine and ten million gallons. This abundant water supply, while affording a plentiful amount for all domestic uses, and sanitary purposes, is very beneficial to manufacturing industries.

*Glasgow.*—Population, 565,714.—The turning point of the history of the water supply of this important city, the second in the kingdom as regards population, was in 1855, when the Corporation bought up the commercial companies supplying water to the city. They soon

abandoned the river Clyde as a source, and took over Loch Katrine; the supply from which was inaugurated by a grand ceremonial, in which the Queen took part, in October, 1859. The other source, that of the Gorbals Waterworks Company, which derived its supply by gravitation from the hills, seven miles to the south of Glasgow, was continued and still supplies a large population living on the south side of the Clyde. The cost of the new Loch Katrine Works and of the acquisition of the old undertaking was £2,100,000; and the supply thus secured was forty-two million gallons a day. In 1885, an Act of Parliament was obtained for the extension of the Loch Katrine Works, at an additional outlay of £1,200,000, which will increase the possible maximum to 112,000,000 gallons per day. The population within the area of supply, which includes extensive suburban districts, is close upon 840,000; the average daily supply per head of the population is 50 gallons. The influence exercised on the public health by the substitution of the pure water from Loch Katrine for the polluted water from the river Clyde is remarkable. In 1832, 1848, and 1853, Glasgow suffered from very severe outbreaks of cholera. In 1866 another outbreak occurred, through a case of cholera imported into the city, but the epidemic did not get the firm hold that it had in previous years, and caused only 53 deaths before its disappearance. The death-rate from diarrhoea has fallen from 1·34, previous to the introduction of Loch Katrine water, to 0·59.

*Huddersfield.*—The Corporation of this Yorkshire town, having a population of about 100,000 inhabitants, acquired the property of the Huddersfield Waterworks Commissioners in 1867; and have since considerably extended the supply. The town is now supplied from three sources, viz:—1. The Longwood reservoirs, capable of storing 70,000,000 gallons of water; 2. The Blackmoorfoot and Deerhill reservoirs, with a storage capacity of 860,000,000 gallons;

3. Wessenden reservoirs, holding 189,000,000 gallons of water. The capital expenditure up to last year amounted to £913,000. The supply is good and pure.

*Leeds.*—Population, 367,506.—A constant supply of pure water is collected amongst the hills, 17 miles from the town, filtered and distributed to every house throughout the borough. The catchment area is 20,684 acres, and the storage capacity 3,908,000,000 gallons. The water supply is entirely in the hands of the Corporation.

*Liverpool.*—Population of the municipal borough, 517,951.—In 1847, the Corporation of Liverpool purchased the undertakings of two private water companies, which then supplied the town with water. Both of these companies derived their supply from wells in the new red sandstone, and they distributed water to their customers only two or three times in a week, and for not more than two or three hours at a time. The Corporation in 1852 commenced to carry out what was known as the “Rivington Pike” scheme, designed by Mr. Hawksley. This was a project for impounding the head waters of the rivers Douglas, Yarrow, and Roddlesworth, by the construction of large reservoirs in a hilly and sparsely populated district between Bolton and Blackburn. These works were completed in 1857. They consist of six reservoirs, with a total surface area of about 600 acres. The estimated contents, when they are full, amount to 4,200,000,000 gallons. All the water is filtered in filter beds, comprising  $6\frac{1}{4}$  acres, before it is distributed in Liverpool. The aqueduct from Rivington to Prescott, near Liverpool, is twenty-five miles in length and, with the exception of one mile of tunnel at Hilton House, it consists of a cast-iron pipe, with the uniform internal diameter of 3 feet 8 inches. The quantity of water thus available for Liverpool, after delivery of compensation water to the rivers, is about 12,000,000 gallons *per diem*. Several of the wells acquired by the Corpora-

tion in 1847 have been abandoned, and new wells in the same new red sandstone formation have been sunk, as the requirements of the district increased. The total yield of these wells is about 6,500,000 gallons daily. But the exigencies of Liverpool became so much greater that it was found requisite to go further afield, and it was eventually decided to construct an artificial lake in the valley of the Vyrnwy in Wales, and to bring the water thence by aqueducts to Liverpool. When the Vyrnwy supply is available, as it is hoped it will soon be, Liverpool will not only have reason to be proud of one of the greatest engineering triumphs of the day, but will possess a fine constant supply of pure water. Most of our readers are, doubtless, familiar with the outlines of the Vyrnwy scheme, through descriptions which have appeared, at various times, in *HYGIENE* and other journals. Some brief particulars will, however, be of present interest. The area of the gathering ground from which water is collected is 18,000 acres, in addition to which the Corporation have power to divert two neighbouring streams, the Cowny and the Marchnant, with a gathering ground of 5,200 acres, so that when all of the works contemplated by the Act of Parliament passed in 1880 have been carried out, the lake will have a total watershed of 23,200 acres; and it is estimated that the rainfall on this area will yield an average daily supply of 53,000,000 gallons, of which 40,000,000 gallons will be available for Liverpool, after delivering compensation water to the river, in accordance with the provisions of the Act. As regards the general dimensions of the lake, when it is full to overflow, the surface of the water would be 825 feet above the sea level (ordnance datum) and the principal dimensions are:—Superficial area, 1,121 acres; length,  $4\frac{3}{4}$  miles; average width,  $\frac{1}{2}$  mile; greatest depth, 84 feet; contents in gallons, 13,125,000,000; in cubic feet, 2,103,000,000; in tons, 58,000,000.

*Preston.*—Population, 107,864.—The Corpora-



tion of this large manufacturing town in Lancashire acquired possession in 1853 of the Preston Waterworks Undertaking, established about twenty-one years previously. The Corporation have since effected various extensions and improvements, both as regards the area of collection and the facilities for storage, and further ones are under contemplation. The water supply is derived from moorland gathering grounds, distant about 20 miles from Preston; and the water is of good quality, as well as abundant.

### COUNTRY LIFE.

By DR. ALFRED J. H. CRESPI (Wimborne),  
formerly Editor of the *Sanitary Review*.

THE drifting of the population into the great towns is continuous, and is becoming more and more rapid and general. It is more than ever the rule to find that good houses, with some pretence to rural seclusion, even when close to excellent towns, will not let. To the Sanitarian more particularly the question is full of interest on other grounds than economic ones, for he cannot regard the depletion of the open country with equanimity. Innumerable powerful articles have been written dealing exhaustively with the evil influences of town air on the physique of the young and growing. Some writers may overstate those adverse influences, but, in the main, they are perfectly right. The matter also presents itself under another aspect—social and economic considerations of the first importance. The removal of half-a-dozen wealthy families from a country parish to a great town necessarily means the migration of ten times as many poorer ones, who must go where employment is to be found. A village may be half ruined by the departure of three very rich families, and I have actually known a country town of some size depressed by the temporary removal of one titled family of immense fortune.

A curious agreement is noticeable among

writers concerning the Englishman's fondness for country life. One might fancy that as soon as he could in any fashion compass it, he left the town for the country; and that anyone compelled to exchange the country for the town was wont to complain; much as people do when duty or necessity calls them to an unhealthy foreign station. My conviction is, however, that as in everything else connected with our national life, there is a vast amount of affectation in the matter—the Englishman talks of his love of the country, but he clings to the town. The other side of this picture is seen in the open country, where good houses will not let; the rich, owning country houses, do not occupy them for more than a few weeks a year; and the population is rapidly and ominously gravitating to the larger towns, or, at any rate, to important railway junctions. The last is undoubtedly the case. Go where one will, the great towns are growing rapidly; the smaller are, usually, getting larger; the villages are stationary, or actually dwindling; while the open country districts are, without exception, less and less frequented. Why is this? In 1844, Count Cavour wrote the following suggestive sentences, in which, tersely and elegantly, he summed up the social and moral advantages of country life: "The fact of living in the country ought to have the best influence upon society. I think it is of a nature to partially remedy the moral disturbance which a great revolution produces in the thoughts and institutions of European nations; for it tends to substitute for the material ties, which bound the classes together in the feudal ages, relations of reciprocal good feeling in harmony with moral superiority on one side, and voluntary dependence on the other. It is difficult properly to appreciate all the good that comes from the presence of a rich, or even well-to-do family, in the midst of a poor and ignorant population. The good they will do will bring no glory nor applause in the papers, neither will any university reward it with an honorary

degree, but its influence will be immense. It is so easy for an intelligent and philanthropic landowner to gain the respect and affection of all those who surround him, and to exert a moral influence which will be much higher than the compulsion exercised by feudal landowners. This moral influence of the rich upon the poor, of the intellectual worker upon the manual labourer, of the capitalist upon the proletarian, would strengthen the foundations of social order, and dissipate the fears which are awakened by the revolutionary spirit." No one ventures to deny that country life is healthier, quieter, and (in certain senses) pleasanter than town life; no one doubts that the beauty of many parts of England, more particularly of the south and south-west, is unrivalled, and the most exacting traveller confesses that, go where he may, visit what glorious scenes he likes, no prettier landscapes, no lovelier pictures offer themselves than an English or Welsh village or park. Where else is the grass so green? Where are the trees more leafy? Where is the summer so cool and pleasant? Where can life flow on more like a gentle river, calmly and peacefully? Still the fact remains that people talk of the country, but live in the town; that, as a rule, to build houses in the open country, except a very few cottages here and there, is a bad speculation; and that, with certain exceptions, the country, if not less visited, is certainly less permanently dwelt in than it was twenty or thirty years ago.

Great differences undoubtedly obtain in such matters, and the advantages and disadvantages of districts are very unequally distributed. Many of the loveliest villages are far from railways, and have hilly, bad roads; while some places, most highly favoured with frequent postal deliveries, telegraph offices, good shops, level roads, and an admirable railway service, are precisely those that do not present the best and most characteristic charms of country life, and so do not attract strangers. I shall try to deal, on the one hand, with the advantages;

on the other, with the disadvantages of country life; not forgetting, however, that any man or woman who has to earn his bread and cheese, or is actually engaged in some profession, must go where necessity, not inclination, calls.

As a permanent residence, life in the open country, in the majority of villages, and in many small decaying old towns, has serious drawbacks, which fatally militate against their selection as places of residence, except by recluses, and by persons owning a house in the neighbourhood, which they are unable to let or sell, and so cannot conveniently leave. Such places may have the pure air, wooded slopes, shady lanes, picturesque landscapes, and simplicity of rural life; but the railway station may be many miles off, and this means a carriage; or if the station is more accessible, it may be served by half-a-dozen slow, tedious, stopping trains a day; no late ones probably, or if such should run, a drive of eight or ten miles near midnight, over rough, dark roads, across moors, and through overflowing water-courses is not attractive. Letters come late in the morning, once a day, or perhaps only every other day; and in many instances there is no delivery at the house, and letters may have to be fetched by a special messenger. This is no highly coloured picture. I once had lodgings only a mile from a large station in Devon, and not 500 yards from the middle of a town with 6,000 people, and to my disgust found there was no delivery of letters at the house. At this moment some villages, not an hour's easy drive from Bournemouth and Poole, have deliveries on Tuesdays, Thursdays, and Saturdays only, and the letters are delivered as late as eleven o'clock; telegrams cost 5s.; fruit and vegetables are bad, dear, and scarce; milk is not to be got, or is at famine prices; fish can never be obtained; and shopping is difficult and unsatisfactory.

During the long winter, from early in October to the end of April, callers are necessarily rare; neighbours do not often venture out; the roads



are execrable; the fields impassable; and, in short, at that season of the year, even the gloom of large towns is preferable, for the pavements are level and dry, much is going on, and there are plenty of pleasant evenings, and cheap amusements of high quality, while greater economy of living is practicable.

In the open country, lectures, amusements, concerts, and evening gatherings are necessarily rare, and usually of small interest, and fall very flat on any one who, even for a short part of his life, has been familiar with the great centres of population. Even the high-born and wealthy cannot escape these discomforts, and the lower middle classes are oppressed by them.

But between the disadvantages of the open country, especially in the north or extreme west of the kingdom, and the advantages of small towns, well served by trains, the interval is enormous. Scores of beautiful little towns could be named, with all the advantages of modern life, where country of the most exquisite beauty and fertility comes right up to the houses; and a quarter of a mile from the Market-place, cheap and excellent sites for houses and gardens may be found. To suppose, like many great town residents, that all country towns are behind the times, and cut off from the world, is absurd. Railway accommodation exceptionally good is, to mention a few places, found at Newton Abbot, Bishopstoke, Basingstoke, Wimborne, Dorchester, Brockenhurst, and scores of other southern towns. Schools of high repute have made Marlborough, Sherborne, Malvern, Monmouth, and Wimborne famous. Newspapers, letters, telegrams, and railway facilities are as well managed in many towns of 4,000 to 8,000 inhabitants as in all but the greatest cities. Life in any of these places has many attractions, while the fresh air and abundant elbow room are worth a great deal, and quite make up for any advantages attaching to residence in an obscure street far from the centre of a great city. I have several times passed an evening with some excellent middle-

class people, whom I had known for years; they hardly knew a soul, and for all they saw of *the world* might as well have taken refuge in a remote country village ten miles from a railway station. I knew that they were once connected with Birmingham, and had lived in a pretty house in a third-rate street, where the leading professional and business men knew as little of them as though they were living at the North Pole. It was curious to observe how much they enjoyed their move to *town*, six or seven miles from the City and the West End, "for the society was so much better than in Birmingham, and there was so much to see and do;" but they never saw or did anything that I could ever learn.

Disadvantages there are in the life of small towns, and that must be confessed. The cliques, which revolve in narrow, but not approximating or intersecting orbits, are among the greatest; there is, also, the detestable and capricious exclusiveness, which confines the slender social resources within narrower dimensions than there is any occasion for. But are large towns free from the abominable exclusiveness and jealousy of English society? If a man wants to be cut off from the companionship of his fellows, and to know no one, let him go with a slender income, no letters of introduction, no professional status, no dignified occupation, nothing remarkable in conversation, appearance, or antecedents, to the flourishing suburbs of any large town in the Three Kingdoms, and he may live and die unknown; his neighbours will not call on him, he never learns anything of the surrounding crowds; no public honours ever cheer him, he is useless and cut off from the world, although perhaps capable of doing excellent work. Now in a small southern town, like those named above, a man with fair appearance, with nothing against him, and with an income of from £400 to £800 is a somebody; not that even there he, in these days of perpetual movement, exercises much influence or gets to know everybody in his own set or social

grade for years, but if he plays his cards well, he is soon favourably known, makes friends, and finds life pleasant. During the summer, amusements, social gatherings and little changes, are frequent, and in taking part in them he finds himself a person of importance. If he likes to help in the Sunday 'School, or busy himself in church matters, or to air temperance, anti-vivisection, vegetarian, or philanthropic views, a respectful hearing will be given him. If he is a botanist or an archæologist, he can become a member of the County Field Club or Society—a matter of half a sovereign or at most a guinea a year—he is always welcome, always able to take some part, and he finds his level, and discovers that, at small expense, he can dispense some hospitality, and get the good word of his neighbours. As for a house, he can have excellent ones at £60 to £80, not better than the same rent would command near a great town, but farther from the road, with a larger garden, a better tennis lawn, and the chance, it may be, of renting a little field, which will do for cricket, or for a horse or a cow. After a time, life has a tendency to get a little humdrum, especially when he has made the acquaintance of all the people near, and has discovered their crochets and likes and dislikes; then a change is desirable, and when it can be managed, grateful. In many cases, however, the life of a small, well-appointed town is pleasant and, fairly weighed, has much to recommend it, while it is incomparably better for the physique and development of the children of the family.

One often hears it said that, when it is not possible to live in a large town, the open country is best. "No country town for me, thank you; if I cannot live in London, then give me a house in the open country." I have lived in large and small towns, and many of them; I have lived in a place in the United Kingdom, where I was once exactly a month without getting a letter or a paper, and where the delivery of a telegram cost three pounds,

and to send one off meant a special journey of twenty-two miles at a charge of five pounds. And I positively maintain that the smaller a village the greater its disadvantages, and after the first sense of change and freedom from restraint is over, the monotony of existence becomes most trying. Fancy getting newspapers the afternoon of the day following publication, as once happened to me in a Gloucestershire town, only eight miles from Cheltenham, or receiving letters, which had to be sent for at one, the postman returning at three o'clock, as I once found was the case in a North Yorkshire village.

With all the resources of studious habits, a large library and less dependence than most people on the outside world, I affirm that the open country is not pleasant as a permanent residence. All the same, I believe that, making due allowance for the undoubted advantages, in many ways, of great towns with their varied society, intellectual and commercial vigour, better amusements and greater cheapness, there are hundreds of thousands of people without calling or profession requiring them to reside in a large town, who do not affect amusements, and who do not care for any pursuit demanding for its successful prosecution the facilities of large towns; for these people, the pleasantest, most useful, and most dignified life can be found in a small country town, with a score or two of nice shops, a first-rate railway station, and a sunny and genial climate. Fairly weighed, the advantages of such country life immeasurably outweigh its advantages. These are matters, however, that no Act of Parliament can change—the remedy is in the hands of the cultured, monied classes: they may, nay they do, complain, that London and the great towns are yearly growing apace, but as I have said above, whenever without good cause they remove to those large towns, they compel the poor to follow them, and they aggravate the very evil which they so much deplore.



## THE CURE OF CONSUMPTION IN ITS ECONOMIC ASPECTS.\*

By DR. HAMBLETON, President of the Polytechnic Physical Development Society.

No words of mine are required to impress upon the readers of *HYGIENE* the great importance of this subject, to express the intense interest that is universally taken in it, or to point out the far-reaching influence its public establishment will have upon scientific investigation. But it is, perhaps, necessary for me to say that I fully recognise the grave responsibility that rests upon anyone who makes the statements I am about to make, and that I am completely justified in accepting that responsibility. Perhaps it may be within the recollection of some that at the Birmingham and Manchester meetings of the British Association in 1886-87 I read papers giving the results of a series of investigations on consumption and chest types. I showed in the former paper that consumption was directly produced by the conditions that tend to reduce the breathing capacity below a certain point in proportion to the remainder of the body, and contended that it could be both prevented and completely recovered from by the adoption of measures that were based upon that interpretation of its nature. In the latter I adduced evidence that proved that the size and shape of the chest after birth solely depended upon the conditions to which it was subjected, that there was the same relationship between the size and shape of the other parts of the body and the conditions to which they were subjected, and that this law obtained in the animal and vegetable kingdoms. This research, as a whole, showed that there was a complete series of types that had at the one extreme consumption, and at the other the finest type of health, directly produced by the

conditions to which they had been submitted. And I referred to the immense importance of the issues that were thus raised, both from a practical and scientific point of view.

At that time the evidence was mainly derived from experiments, although I had some most valuable and significant practical experience, and I found the general opinion was that it would be extremely difficult, if not impossible, to practically apply that knowledge. Since, then, however, the practical evidence of the relationship between conditions and types of chest has been irrefutably established at the Polytechnic. By the application of that knowledge in the ordinary routine of daily life, the members of the Polytechnic Physical Development Society, although engaged for many hours daily in all sorts of trades and occupations, some of them under very unfavourable conditions, have shown how greatly the chest girth, its range of movement, the vital capacity, and the power of inspiration and expiration can be increased. In 1890, at Leeds, I gave the measurements of 100 members. On reference to the report it will be found that the average increase of the chest girth was  $1\frac{3}{4}$  inch, that of the third class being  $1\frac{1}{4}$  inch, the second  $2\frac{1}{8}$  inches, and the first class  $3\frac{3}{8}$  inches.

At a subsequent examination for the Society's gold medals and certificates the first three members had obtained an increase of  $6\frac{1}{2}$ , 5, and  $4\frac{3}{8}$  inches respectively, and although some of our best members are constantly leaving the Polytechnic, and new ones joining us, I am glad to say there has been a further average increase of one quarter of an inch in all classes. Many of the members are engaged in the trades that have a high rate of mortality from consumption, and not a few of them would have long been in the ranks of the consumptives had it not been for the efficacy of the directions given them by the Society; that is to say, the practicability and certainty of measures that are necessary to secure the prevention of consumption have been fully demonstrated.

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\* Based on a paper read before the British Association for the Advancement of Science, Cardiff, August, 1891.

Whilst one part of the work has been practically applied at the Polytechnic, the practical application of the other has been equally successful in the amelioration and, where the disease was not too extensive, the cure of consumption. I may state that by the cure of consumption I mean the possession and appearance of sound health, natural breathing from base to apex, a well-formed and fairly-developed chest, a good range of movement and vital capacity that have stood at least a twelve months' test. The cases that were referred to at Manchester in 1887 as having completely recovered remain well, and those that have subsequently recovered went through last winter without giving the slightest indication of a relapse. There has been no relapse in any of these cases of cure, and no failure. Up to the present the mortality of all the cases has been under ten per cent., and has been limited to those who were most extensively diseased, and who were, in fact, *in extremis*. There are others who have derived great benefit, and some of them will ere long take their places in the ranks of the cured. One of the latter has stolen a march upon me. He presented himself for life assurance, was accepted as a first-class life, and obtained a reduction in his premium. He is unquestionably well, but he would not allow me my twelve months' test. There are not a sufficient number of cases to compare with the statistics obtained at the Polytechnic, but I may say the increase in the chest girth ranges from  $1\frac{1}{2}$  inch to over 4 inches. We have chest girths of over 38 and 39 inches; the range of movement varies from 3 to over 6 inches; and the vital capacity greatly exceeds in some cases Hutchinson's standard of health.

I have now shown that the results that had been experimentally obtained have also been equally well obtained in the practical application of that research, that each part of the investigation confirms the other, and that they together form a complete and harmonious whole. Consequently I have also shown that we now

have before us and within our grasp the real cure for consumption, that we can effectually prevent its production, and that by united and continuous action in both directions we can, ere long, practically remove this curse of civilisation from our midst.

What steps are to be taken to secure the great benefits of this advance in knowledge? Let me, in the first place, remind my readers that consumption is a disease of civilisation, a part of the process of evolution by which an adjustment is made between the body and the work that it has to perform under the ever-changing conditions of advancing civilisation, and that it is directly produced by the habits and surroundings that tend to reduce the breathing capacity below a certain point in proportion to the remainder of the body. Obviously, the first thing that has to be done is to prevent the production of this disease; and for that purpose we must see that the body is used to the extent its size demands, and that the work it has to perform is carried on under conditions that are favourable to the body—that is to say, we must so arrange our habits and surroundings that their tendency as a whole is to develop the lungs. Each act of man, each factor in his environment, tends either in his favour or against him. We must avoid as far as possible—and where that is not practicable we must counteract their action—those that tend to reduce the breathing capacity. Close, badly-ventilated, or hot rooms, the inhalation of any kind of dust, the habit of taking small quantities of alcohol (termed “nipping”), stooping positions that cramp or impede the full and free movement of the chest, the corset or tight-fitting clothes, overloading the body with clothes, etc., are examples of such conditions. And we must place ourselves as far as possible under the conditions that tend to develop the lungs. We should spend as much time as possible in some form of active exercise in the open air, live in rooms that are in direct, free communication with the external air night



and day, summer and winter, and keep their temperature down. We ought to have the clothing quite easy over the chest at full inspiration, wear wool next the skin, take a tub daily, hold the body erect with the chest thrown well forward and the shoulders held well back, get into the habit of taking deep inspirations followed by full expirations, and breathe through the nose. And we should go in for singing, swimming, gymnastics—Ling's system by preference—and for one or, better still, several forms of athletic sports, rise early, and maintain the temperature of the body by muscular exercise. I have briefly indicated the conditions that are favourable or unfavourable to lung development, and to that I will only add that measurements, by the tape, the spirometer, and the manometer, should be regularly taken, recorded, and compared with the standards that indicate a fully developed chest, and that it is the plain duty of each one of us to see that he stands well in that respect, for we can protect ourselves from the possibility of an attack of consumption by securing and maintaining a lung capacity far above the point at which the disease originates.

The second direction in which we must take action, if we mean to remove this curse of civilisation from our midst, is to recognise early, and treat promptly and adequately, those who have the great misfortune to be its victims. This is the state with which we have to deal here. The lungs are being progressively destroyed by a process of irritation caused by more work being thrown upon them than they are able to effect, and this inability has been produced by their having been and still being subject to conditions that tend to reduce their capacity; and, further, during the progress of these events, the other organs have become involved by attempting to perform compensatory work, with the result that the general health is more or less seriously compromised. Consequently, in order to adequately deal with this state of things, we

must treat consumption upon the following principles:—To establish an equilibrium between the amount of interchange required to be effected and that effected; to enable the other organs of the body to perform their ordinary functions; to restore to the lungs their power of adjustment to their external conditions; and to attain the above without producing indications of friction. That is, in other words, we must arrest this process of irritation, restore the general health and develop the lungs to the required amount, in order to effect the cure of consumption. I will now briefly indicate the method of applying the principles above laid down. We must, to arrest this process of irritation, remove the conditions that impede the effecting of those interchanges by placing the patient under conditions that tend to develop the lungs, and make good any deficiency that may remain by causing compensatory action by one or more of the other organs. We must proceed with measures for the restoration of the functions of any organ that may have been deranged, and when we have obtained an arrest of the disease, and effected an improvement of the general health, we must begin to develop the lungs. We must carefully select appropriate medicines and measures for each purpose we have in view, use them at the right time and to the right extent, and watch their effects, so that if there be any indication of friction we may at once effect the necessary modification, or use some other medicines or measures for that purpose.

It is easy to cure consumption at the commencement, even when both lungs are affected. It can be cured when there is a large amount of disease, and it may at least be ameliorated when both lungs are extensively diseased. I speak from practical experience, and I, for one, will not attempt to place a limit upon the great power of Nature, when all her forces are called forth and aided.

We are now in a position to consider the very important economic questions that are raised by

the results of this investigation. I would remind my readers that I approach this part of the subject as a physician who has had no opportunity for the study of political economy, and I have to request indulgence for the mode in which these questions will be laid before them. The removal of consumption is but a small part of the great changes that must follow the recognition of the relationship between man and his surroundings, but it is in itself of sufficient importance, and will also serve as an example of the questions that will have to be raised and met, in this and the next generation, for me to draw your attention to some of the necessary effects that removal will produce. Every year we have in round numbers about 70,000 deaths, and 200,000 persons suffering, from consumption in the United Kingdom. A reference to the reports of the Registrars-General will show that the greatest part of this loss occurs at the age in which men are engaged in the production of wealth, and we know that amongst them are those who have devoted most care and attention to their work, whether of the brain or of practical skill in some other direction, and who had a most successful career before them. The following table, taken from the supplement to the Registrar-General's Report, gives the calculated loss from consumption amongst various classes per thousand deaths:—

|                           |     |     |     |     |
|---------------------------|-----|-----|-----|-----|
| Cornish miners            | ... | ... | ... | 690 |
| Earthenware manufacturers | ... | ... | ... | 473 |
| Printers                  | ... | ... | ... | 461 |
| File makers               | ... | ... | ... | 433 |
| Cutlers                   | ... | ... | ... | 371 |
| Brewers                   | ... | ... | ... | 334 |
| Stone quarriers           | ... | ... | ... | 308 |
| Drapers                   | ... | ... | ... | 301 |
| Publicans                 | ... | ... | ... | 295 |
| Tailors                   | ... | ... | ... | 285 |
| Cotton workers            | ... | ... | ... | 272 |
| Wool workers              | ... | ... | ... | 257 |
| Shoemakers                | ... | ... | ... | 254 |
| Builders                  | ... | ... | ... | 252 |
| Carpenters                | ... | ... | ... | 204 |
| Hosiery makers            | ... | ... | ... | 168 |
| Labourers (agricultural)  | ... | ... | ... | 122 |
| Gardeners                 | ... | ... | ... | 121 |
| Fishermen                 | ... | ... | ... | 108 |
| Farmers                   | ... | ... | ... | 103 |

In the Army we have another example of this loss, that almost conforms to a scientific demonstration on a large scale. During the five years 1880-84 there were from tubercular disease 6,749 admissions into hospitals, 1,331 deaths, 1,063 invalids sent home from abroad, and 2,356 finally discharged the service. The financial loss to the country from the deaths and invalids discharged, on the estimate of Lord Eustace Cecil at £120 per man, amounted to £442,440, and to that must be added the pay, cost of maintenance and treatment of the invalids that remained in the Army, the cost of sending home and replacing the invalids from abroad, the pensions to the invalids discharged—that is to say, consumption was not only a serious source of waste in the Army, but it also caused a financial loss that must have amounted to millions. And I see, according to a leader in the *United Service Gazette* on the last Army Medical Report just issued, that waste of men and money is practically the same. Sick benefit societies and life assurance companies suffer heavily from the same cause. I had an opportunity of perusing the returns of the Post Office Sick Benefit Society, and found it was losing about £2,000 per annum, while the loss to the British Insurance Associations through consumption varied from 7·80 to 13·84 of all deaths. Now, if the practical application of a part of this advance in knowledge will ere long add some 60,000 lives every year to the population, and will stop this great waste of wealth-producing power, what will be the economic effects of the immense changes that will take place when man is trained and fitted to successfully cope with the injurious conditions of his surroundings—that is to say, when man has applied the forces of evolution to his own protection and advantage?

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NOTHING NEW UNDER THE SUN.—The Pandit Janardhan, of Lahore, has contributed an article to the *Asiatic Quarterly Review*, in which he shows that the ancient Indian sages attributed many of the maladies with which mankind is afflicted, to microbes. The title of one of the Sanscrit writings from which he quotes is, "On the living germs of disease, and how they are produced."



## PATENT MEDICINES.\*—No. 12.

ANONYMOUS ABUSE; WARNER'S "SAFE CURE" AND MEDICAL STAFF; A QUACK LIBEL CASE; MORRISON'S PILLS; BAILLIE'S, DIXON'S, FOTHERGILL'S, AND LEE'S PILLS; MODERN MYSTICISM AND MATTEI'S ELECTRICITIES.

"Who is this, that deafs our ears with abundance of superfluous breath?"—SHAKESPEARE: King John.

SINCE the commencement of this series of articles we have received so many abusive and threatening communications, apparently from persons connected with the patent medicine line—in their anger or their modesty (?) they have omitted to give their real names and addresses—that we are getting quite used to letters of this sort. Indeed, we are becoming hardened, and ready to accept them as proofs, notwithstanding their invariably uncomplimentary language, that these articles are too truthful to be palatable to some people, at least. Well, we started on the old-fashioned plan of calling a spade a spade; and when we consider the extravagant boasts which our anonymous correspondents make concerning the often purely imaginary properties claimed for their wares, we cannot help thinking it would be better if they would go straighter to the mark, and not perpetually walk round the truth.

There is another curious coincidence about these communications, besides the abuse, energetic enough to make the fortune of a professor of (bad) languages, namely, that they all propound questions which they do not seem able to reply to. Even if, as the writers would seem to imagine, abuse is argument, questioning, without supplying the answer when needful, is a low form of logic. One correspondent remarks,

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\* The articles on Patent Medicines which appeared last year in *HYGIENE* have been reprinted and published in book form; 128 pages, price 1s., post free for 14 stamps. For Contents, see the announcement in our advertising columns. The third edition is nearly exhausted. During the present year the following articles have appeared: No. 10, *Beecham's Pills* (January); No. 11, *Warner's Safe Cure* (April).

"Why should not Warner and Co. have a large medical staff composed of experienced physicians?" We never said they should not; in fact, a pamphlet dropped into the letter-box at our private house distinctly states that they are fully equipped in this respect. If our correspondent will look again at our article on "Warner's Safe Cure," in *HYGIENE* for April, he will see that we not only refer to this statement, but that we exhibit a natural curiosity as to the names and professional position of the physicians of "long experience and extensive practice" who are always, like Mr. Micawber, waiting for somebody or something to turn up at Warner and Co.'s, where "consultations by letter or in person are invited, and medical advice is cheerfully given without charge." This may or may not be the case. The pamphlet assures us of it, as well as of "strictest confidence"; but, in illustration of the old adage that there is an exception to every rule, the only experience we have had of Warner and Co.'s medical staff and their cheerfully gratuitous advice is derived from a letter which was shown to us by a young man who was induced to write to Warner and Co.'s physicians. The reply he received urged him to fill up a special printed form, comprising no less than forty questions, many of them absolutely unfit for publication. The fee demanded for the first month's treatment was £4 4s.; for the second month, £3 3s. This does not carry out the liberal offer made in the pamphlet, nor does it enlighten us much as to the composition or number of the medical staff. The letter is signed by an individual who styles himself M.D. Pa., U.S.A., a degree unrecognised in this country. The following is an extract from an official answer to an inquiry on this subject addressed to the Registrar of the General Council of Education and Registration of the United Kingdom:—"The qualification of M.D. Pa., U.S.A., does not entitle to registration in the Medical Register." The reason is not a difficult one to solve.

What a ridiculously small medical staff it would be, were it composed only of one M.D. Pa., U.S.A.; but, of course, Messrs. Warner and Co. must know what they write about, and they mention "physicians." Plural, be it observed; a plural number would constitute a staff, though one would not. If Messrs. Warner and Co. are really too preoccupied with baking powders (what wonderful "puff" paste they ought to turn out!) to give the names of their physicians just at present, perhaps they will obligingly remedy this omission in the next million of their pamphlet. We have carefully looked through the present, and find no information on this important point. We came across a testimonial purporting to emanate from a medical practitioner. It is as follows:—"91, Hoxton Street, London, N., August 12th, 1889.—The greatest recommendation that I can give to Warner's 'Safe' remedies is their vast increasing sale, showing their undoubted worth.—M. E. Williams, M.D., &c." We thought it strangely worded, yet giving such evidence of the writer's acquaintance with the details of Warner and Co.'s business, that we could not help arriving at the conclusion that the writer might have derived his knowledge of the "vast increasing sale" from holding a position on Warner's medical staff. We are again placed in a dilemma, for a close examination of the *Medical Register* and of the *Medical Directory* for 1892, containing the names of 30,035 qualified practitioners in the United Kingdom and abroad, failed to discover "M. E. Williams, M.D.," amongst that large number, any more than the M.D. Pa., U.S.A., who proffers gratuitous professional advice at the rate of four guineas per month! Surely, Warner and Co., in their overweening faith in saltpetre, have not adopted such a curious method of demonstrating their disregard for a profession, which their "Safe" remedies are destined, in their own opinion, to clear off the surface of this planet, as making it a *sine quâ non* that no registered medical man shall be deemed qualified

to act upon their medical staff. If such is the case, they ought, in fairness, to make the fact public. Will M. E. Williams enable us to rectify the omission on the part of the official *Medical Register*? Until then we can speak only of M. E. Williams, &c. Despite his "greatest recommendation" of Warner's "Safe" remedies, he assumedly thinks there is a corner left yet for medical commercial enterprise; for in the chemist's window at 91, Hoxton Street, are displayed a "Blood Purifier," specially prepared by Dr. M. E. Williams, chemist, late army surgeon, and also sundry bottles of what the same individual modestly styles his "Lung Restorer." On the principle that "one good turn deserves another," or, as the Scotch saying runs, "Ca' me, and I'll ca' thee," Warner and Co. should give M. E. Williams, &c., a testimonial asserting that he is as great in purifying the blood and restoring lungs as they are in safely curing with saltpetre diseases beyond the limited resources of the whole medical profession.

Some curious evidence came out only a few weeks since in a trial at the Cheshire Assizes; being an action brought by Dr. Alfred Ellis Vaughan, a medical practitioner at Crewe, against Samuel Johnson, of Wrinehill, near Crewe, "a quack of the purest water," as the Liverpool and Cheshire papers describe him. This Johnson thought fit to publish statements of an undoubtedly and grossly defamatory character concerning Dr. Vaughan's treatment of a patient who, in some way, fell into Johnson's hands subsequently. The pamphlet contained most extraordinary puffs in praise of what Johnson called his Chinese pills; and Johnson coolly announced that he could cure the worst fever in three days certain, the worst inflammation in six hours, diphtheria in six hours, brain fever or inflammation of the brain in twelve hours, the worst quinsy in two days, and stoppage or twisting of the bowels in six hours certain. There was, in short, no disease that could withstand the Chinese remedies.



Marvellous, if true (what virtue lies in that little word "if!"). Indeed, there could be only one thing more marvellous, and that is how any man or woman in the county outside the Chester and Macclesfield Lunatic Asylums could be induced to believe such assertions. We cannot speak as to the composition of Johnson's Chinese pills; but we can state one fact with satisfaction, namely, that the Jury gave a verdict in favour of the plaintiff, £250 damages with costs. Whether Dr. Vaughan was paid the damages and costs after the trial we cannot say, but we fear there is room for doubts on this point, as well as on the Chinese pills.

As to these Chinese pills, we should not be surprised if they contained aloes, for two reasons:—1. Quacks have a remarkable predilection for this cheap purgative, as will be seen upon a perusal of our previous articles. 2. They are also invariably wrong in localising the countries whence it is obtained.

Morrison's pills, specially prepared, of course, at the institution in the Euston Road, dubbed the College of Health, contain a considerable amount of aloes. No. 1, Morrison's, is composed (according to the analysis by Mr. Henry Beasley) of aloes and cream of tartar in equal proportions; No. 2 pill consists of two parts of gamboge, three parts of aloes, one of colocynth, and four parts of cream of tartar, worked up into pills with the aid of syrup. Nothing wonderful or novel about these pills, at any rate, except that one greatly wonders what there is about them to render it necessary for the proprietors of the nostrum to style their emporium the College of Health, or themselves Hygeists. *Apropos* of aloes, this forms a chief component of most quack pills. Here is a batch of four analyses in support of this statement. 1. Baillie's pills: Extract of aloes,  $1\frac{1}{2}$  drachm; compound extract of colocynth,  $1\frac{1}{2}$  drachm; Castile soap,  $\frac{1}{2}$  drachm; oil of cloves, 15 drops in three dozen pills. 2. Dixon's Antibilious pills: Equal parts of aloes, scammony, and rhubarb, with the addition of a small quantity

of tartar emetic; Castile soap to make up the mass. 3. Fothergill's pills: Aloes, antimony, scammony, and extract of colocynth. 4. Lee's Antibilious pills. Aloes, 12 parts; scammony, 6; gamboge, 4; jalap, 3; calomel, 5; soap, 1; syrup of buckthorn, 1; and gum mucilage, 7 parts; mixed together and divided into 5-grain pills. Of a truth, quacks are not over burdened with inventive genius, always excepting as regards their advertisements and testimonials.

Twelve months' delay in vindicating one's position indicates either singular negligence or almost insuperable difficulty. Yet Mattei's supporters have waited longer than this period, and are just beginning to feebly attempt to confute the exposures which appeared in the *National Review* and in *HYGIENE* more than a year ago. They have started a sort of trade journal, mainly filled with praises of wonderful cures effected by Mattei's Electricities (we can tell them of more lasting cures, namely, where people previously devoted believers in the "electricities" have been cured by the articles referred to of such belief, and are likely to remain in that condition), and abuse of everyone who will not swallow their nostrums and their assertions. Apparently the Matteist medicos have "made a pile," as the Americans say, for they offer to bet hundreds of pounds that they are right, and that every qualified medical man (every member of the "orthodox faculty" as Mr. Stead would write), every scientist, and every analyst—Mr. Stokes in particular—is wrong. When they have finished angry asserting and wild wagering, they may descend to logical weapons. At present, it seems that, as a correspondent suggests, "Modern Mysticism" would be a more appropriate title for their monthly exponent than "Modern Medicine."

THE EDITOR.

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HAMPSTEAD.—Mr. Alfred W. Stokes, F.I.C., F.C.S., public analyst for Paddington, St. Luke's, and Bethnal Green, has recently been elected public analyst for this district.

## EPIDEMIC PNEUMONIA AT SCOTTER, IN NORTH LINCOLNSHIRE.

By T. B. FRANKLIN EMINSON, Medical Officer  
of the Scotter District of the Gainsborough  
Union.

WITHIN the last twenty years nearly every town in this country has benefited immensely from the vast strides which sanitary science has made. Many rural districts, however, have not participated in these benefits, but retain old habits and old houses, only the latter, perhaps, are fewer in number and more crowded. Anciently this part of North Lincolnshire presented a very different appearance from what it does now. In place of well-cultivated fields, a wide expanse of heath and morass stretched from the Humber on the north to Gainsborough on the south.

Very great, indeed, is the change wrought by a hundred years on the face of the country, and great too, though not nearly so great, is the change in the habits and manners of the villagers. Unfortunately, similar improvement has not been effected in the villages themselves; many old houses have fallen down, and some new ones have been built; but the new are little better than the old—some, indeed, are worse. The village of Scotter is but a sample of many others, and it only comes into prominence because it has been the scene of a terribly fatal epidemic of pneumonia.

I have been asked to sketch some of the facts of this epidemic in a short paper, and am willing to do so inasmuch as I am convinced that it is high time that remedial measures are sought for and applied. The disease history of the village is well known to me, for I have practised in it ten years, and my father and grandfather practised there, the one fifty-five and the other fifty years.

*The Houses.*—The majority of the houses in Scotter village are built of common brick, often of such porous nature that rain readily permeates the 9-inch walls, making the bedrooms

damp and the wall-papers dank and mildewed. Nearly all have been built without under-draining, and the foundations laid without slate or other damp-proof course, and, as the foundations in the lower parts of the village are often beneath the level of the sub-soil water, the walls are excessively damp, moisture rising in some instances nearly as high as the bedrooms. Thirty or forty per cent. are without spouting, and the rain-water, dropping close to the foundations, hollows out the ground, and lies in pools, making the ground floors damper than they would otherwise be. In other instances the spouting is worse than useless, the water running down the walls from top to bottom making the whole house rank with dampness and mould. Rain-water cisterns are exceptional, forty gallon paraffin casks being mostly used for storing soft water, without provision for overflow which saturates the ground and adjacent walls and floors. The majority of the houses have but two bed-rooms, many have only one, while a small percentage have three or more. A large proportion have either no fireplace upstairs, or those existing are useless. In some houses the roof is so decayed that the whole family has to be crowded into one bedroom.

*Drainage.*—The drainage is in two distinct sections—*south* and *west*. The south sewer is by far the largest, and houses along its course have been the chief scene of the fatal pneumonia. It consists mostly of nine-inch sanitary pipes, and is 630 yards in length. The fall is good, the ground being over fifty feet altitude at its beginning, but less than nineteen feet at the outfall. The work done is as follows: it receives slops and other liquid refuse from eighty-six houses, drainage from four or five farmyards, two slaughter-houses, and the school urinal; and solid excreta from one w.c. At the time of the outbreak there were six rain-water inlets into the main sewer, besides others into its branches; one near the outfall was a naked pipe; four in the main street



old-fashioned, nominally trapped inlets; and one at the beginning a new street gully. The four old-fashioned inlets with "mason traps" consisted of a brick catch-pit, cut off from the sewer by a slab, which, when water was in the pit, acted as a trap. Unfortunately the pits allowed the water to percolate through the porous bricks; consequently these four inlets were more frequently untrapped than trapped, and gave rise to much annoyance to passing along the pathway and those living near. The inlets attached to the houses were often untrapped, consisting of a naked pipe with a depression in the ground or catch-pit to receive slops; in other instances there was a catch-pit covered in by a D trap, but this was necessarily loose and removable. In rare instances gully traps were in use. Thus this sewer had the work of a sewer without its safeguards. It was mostly untrapped, and wholly unventilated and unflushed except during heavy rains. Its natural advantages of fall prevented it being blocked up, but the abominable smell frequently observed in its neighbourhood, showed that considerable deposit did habitually take place in dry weather. The inlets to the three small west sewers were very similar, and much pneumonia has from time to time been seen in houses connected with them, but these sewers receive no w.c. or slaughter-house drainage, and all three together do not carry one-fourth part as much drainage as the large south sewer.

*Disease History.*—Formerly Scotter was notorious for its fevers; a notoriety mainly earned through the frequent occurrence of violent outbreaks of typhoid fever. The cause lay in a deep-rooted scepticism on the subject of sanitary science, and in the nature of the water supply. Dangerous filth was commonly permitted near the houses and wells. The summer of 1868 was exceedingly dry, harvest being more than a month earlier than usual. When rain came a virulent epidemic followed, due, there can be no doubt, to the rain-water carrying a concentrated solution of surface filth into the shallow wells.

Similar epidemics occurred in 1843 and 1858, some families being decimated and several nurses dying. In 1875, chiefly with the object of preventing flooding by storm waters, the village was drained with sanitary pipes. The effect of this drainage has been to banish typhoid fever from the village; the surface water being carried away, the wells are confined to a purer underground supply. On the other hand pneumonia has greatly increased. The disappearance of the one disease and the increased prevalence of the other have, I think, been due to the same agency—the drainage works; their primary use, the carrying away of storm waters, having largely assisted in the eradication of typhoid fever; their use as sewers *without safeguards* having been one main agent in the production of the recent terrible outbreaks of pneumonia.

*Pneumonia.*—The first noticeable epidemic occurred in 1886, beginning in January and ending in June. In the same months of the previous year there had been a severe epidemic of erysipelas, necessitating the postponement of the half yearly vaccinations. The worst case was in a new arrival—an Ordnance surveyor. The pneumonia was not of the fatal type seen in recent epidemics, but was invariably associated with grossly insanitary surroundings; and other diseases, such as erysipelas, diphtheria, epidemic quinsy or diarrhœa, occurred in the same houses, either shortly before or after the pneumonia.

The fatal pneumonia of 1890 began on April 6th, and the cases came in batches of two or three at once, all through April and the early part of May. The most striking feature in this rush of cases was their enormous fatality and partial distribution. Of 20 cases occurring in the parish in 1890, no less than 10 were in a row of 40 houses, all of which are situated within a few yards of the south sewer. These 40 houses had 10 cases, while all the rest in the parish boundaries, 217 in number, had only the same number. They are on

the same side of the main street as the south sewer, and therefore much nearer that sewer than any others. They are mostly small cottages; many have but one sleeping-room, others have two, and a very few three or more. In April, 1890, the forty houses had 137 inhabitants of all ages. The proportion of cases of pneumonia in them, between April 6th and June 21st, 1890, was, therefore, one case to every 13·7 persons; while all the rest of the village proper, with 563 inhabitants, had six cases, or one in 93·8 persons, the remaining four cases being in outlying parts of the parish. Of six old persons, aged 80 and upwards, living in these forty houses on April 6th, 1890, four were swept into the grave. The two who were not attacked had previously gone through attacks of erysipelas, and one was probably screened from the cause of the disease. There was excellent reason for believing that several of the remaining cases scattered throughout the parish had their origin in these houses also. One man had flitted from one of them a few days before his attack, and others had been visiting at them daily, or almost daily. Again, Scotter village contains 180 inhabited houses, 86 of which are connected with or close to the south sewer, and 94 have no connection with that sewer. The pneumonia incidence on the two groups of houses is most remarkable. In the year ending March 31st, 1891, twenty-one cases were seen in Scotter village (population 700); seventeen of these cases occurred in the eighty-six south sewer houses—about one case in five houses, while the ninety-four houses unconnected with that sewer had four cases, or one in 23·5 houses.

Regarding only the fatal epidemic of 1890, and analysing the 86 groups of houses, we find that the 40 houses standing close to the south sewer had ten cases—one in four houses; 26 houses on the opposite side of the road had two cases—one in 13 houses; and 20 houses situated in side roads and elsewhere had no case. The

reasons why the disease made special attack on the 40 houses are as follows:—

1. The main sewer runs close by these houses, being within three yards of most of them, while the width of the road divides it from those on the opposite side.

2. The 40 houses are in continuous rows, more cramped at the back, while the 26 on the opposite side have more breathing space.

3. The 40 houses stand for the most part on distinctly higher ground than those opposite, and it is specially significant that they are on much higher ground than that occupied by 20 houses which escaped entirely.

4. The twenty houses which entirely escaped are not connected with the main sewer, but with less-used branches; and several are not even thus connected, but are counted as belonging to the south sewer system, because they are near those branches.

The above facts point unmistakably to the south sewer as sole or almost sole cause of the fatal epidemic of 1890. If any confirmation be required, it is supplied by the following additional facts:—

In June and July, 1890, traps were inserted in the street inlets to the main sewer in place of the faulty "mason traps," and the forty houses where the disease had committed such havoc also had their inlets trapped. But the twenty houses in the side roads almost escaped attention. When the following spring arrived—the natural season of pneumonia—the disease attacked only one house of the 40, and that a house in a marked condition of order, but made six distinct attacks on the 20 houses which had previously escaped; the reason being that sewer air, no longer able to escape at the highest inlets, was compelled to find vent at untrapped inlets near the 20 houses. Thus these 20 houses had six distinct attacks in 1891, or one case in every 3·3 houses, and this brings them to an equality with the 40 houses where the disease made such havoc in 1890.



*Deficient Rainfall.*—All records of rainfall in the neighbourhood agree in showing that for 92 days, extending from February 1st to May 3rd, the rainfall was less than half the average, and that for at least 41 days (March 24th to May 3rd inclusive) there was actually only a trifle over one-fifth of the average rainfall. The largest fall in April was .15 inch on the 25th. On May 4th, rain began to fall in slight showers, and on the 10th and 11th heavy rain fell. From May 4th to 11th, there fell 1.71 inch, nearly three times as much as had fallen in the previous 41 days, and nearly four times as much as fell in the month of April. When the epidemic began on April 6th, the rainfall for two months had been only half the usual amount, and the drought continued with much greater severity for another month. It was during this period, April 6th to May 8th, that the epidemic arose, accomplished its terrible task, and came almost to an abrupt close in Scotter. The evidence as to the part played by rainfall affords signal confirmation to that already adduced, and nothing appears wanting in the chain of evidence connecting this Scotter epidemic with sewer emanations. The terrible and explosive nature of the outbreak was due to accidental conditions of weather and season, acting through a sewer which, on account of its good fall and unprotected condition, was specially adapted for distribution of sewer air to the householders it served. From Scotter the disease extended, after about a month, to two neighbouring villages. The manner of its introduction has not been certainly ascertained, but it is believed to have been effected by means of winds carrying the pneumonic germs from the south sewer at Scotter to the sewers and surface nuisances of Scotton and Messingham.

The following table shows the results in adults of the most fatal of the epidemics—that of 1890.

*Adult Pneumonia Cases of 1890.*

|                  | Scotter. | Scotton. | Messingham. |
|------------------|----------|----------|-------------|
| No. of cases ... | 18       | 2        | 10          |
| Males ... ..     | 10       | 2        | 8           |
| Females ... ..   | 8        | 0        | 2           |
| Recovered ...    | 5        | 0        | 4           |
| Died ... ..      | 13       | 2        | 6           |

The exodus of the best labourers from many purely agricultural districts is a matter of serious moment. The immediate sufferers are the farmers and labourers. The farmers, compelled to use less labour, are in danger of drifting into an inferior style of agriculture; while the labourers, tempted into towns by higher wages and better houses, make a change, but no adequate improvement in their condition. Meanwhile, what concerns onlookers like myself, is the fact that the rural population is deteriorating in physique and calibre. It is not a question of diminution in actual numbers, but the fact that the finest specimens of the agricultural labourer are disappearing, leaving behind the weakly, the crippled, and the aged. Doubtless the impoverished condition of farming interests was the first exciting cause of this exodus, but agricultural depression has ceased to be acute, yet the migration continues. There are many causes for this continued unsettled condition; one of the most important is the lack of good and sufficient house room. The sanitary condition of some villages in this neighbourhood is disgraceful. In old times filth was allowed to accumulate on the surface near the houses, and produced its crops of diarrhœa and enteric fever. Now, however, the liquid waste is poured into pipe sewers, and there the solid sediment is stored until a thunder-shower drives it out. These sewers, being neither flushed, ventilated, nor adequately trapped, are contrivances for distributing germ-laden air around the houses. Hence it is that of late years pneumonia has increased in prevalence and fatality. The remedy for this state of things, it may be thought, is easy, and in the

matter of drainage and sewerage no doubt it would be, if the inhabitants themselves could be got to appreciate the gravity of the matter. A little money wisely spent would repay itself tenfold in saved lives and increased health and wealth. But in the matter of house sanitation many and serious difficulties present themselves.

Wealthy property-owners are few, and chiefly live at a distance; the question of the healthiness or otherwise of the houses is rarely inquired into by them, or appreciated by their tenants. Most of the houses belong to small owners, who can with difficulty be induced to do ordinary repairs, not to speak of improvements. In a word, house property does not pay, and very few houses are built. Some of those constructed within the last forty years have been made out of old disused barns and stables; in some other instances the landlord has allowed the cottager a small sum with which to build according to his own tastes and means, and, as a result, shaky, thin-walled, cramped buildings have arisen, from which the dampness of one winter is hardly expelled before another comes round. I know houses built in this way, miserably unhealthy, without a fire-place in a single bed-room.

What then should be done? I think this: the County Councils should appoint a skilled and responsible officer to report on the condition of the different villages. Houses unfit for habitation should then be compulsorily purchased by the Council for their real value, taken down, and new ones built. In other cases, where the houses are in bad condition, but admit of sufficient improvement, the owner might have the option of sale or repair to the satisfaction of the Council. A public body could thus do effectually what would be impossible to private enterprise, and an incalculable boon would be conferred on many rural districts, and a check put on the exodus of able-bodied men, an exodus damaging alike to town and country.

[Those of our readers who desire fuller details of the remarkable epidemic described in the

foregoing article, are referred to Mr. Eminson's pamphlet, published by Messrs. Kimpton and Co., High Holborn, London. Price 1s.—Ed. "HYGIENE."]

## BRITISH HEALTH RESORTS.\*

### No. 20.—Buxton and The Peak.

THE Peak Country deserves everything that has been said about it—grass so green that on the hottest and driest day it looks as though all the greenness, which had deserted other parts of the land, had taken refuge here, timber of surpassing verdure and size, shade so dense that not even the foliage near Plymouth offers anything more remarkable, hills usually fertile and well cultivated to the summit, graceful rivers flowing rapidly along, making pleasant music as they go, and valleys which, when the sun shines upon them, look like bits of Paradise. Eliza Cook did justice to this loveliness in a few musical lines:—

"I was bound like a child by some magical story,  
Forgetting the South and Ionian vales,  
And felt that dear England had temples of glory  
Where any might worship, in Derbyshire Dales."

Could one only count on three months of warm, sunny weather, few would care to seek other lands, and the Dales of Derbyshire would be crowded with visitors. Fortunately, perhaps,

\* The object of this series is to direct attention to the merits of different British health resorts too often overlooked and neglected by persons who are put to much expense, trouble, and loss of time, in visiting Continental spas, instead of availing themselves of facilities open to them in their own country. No. 1, Hastings and St. Leonards; No. 2, Cornwall; No. 3, Droitwich and its Brine Baths; No. 4, Swanage; No. 5, Isle of Man; No. 6, Lowestoft; No. 7, Llandrindod Wells; No. 8, Rostrevor (Ireland); No. 9, Cromer and Yarmouth (Norfolk), and Rye and Camber (Sussex); No. 10, Brighton; No. 11, The Undercliffe, (Isle of Wight); No. 12, Bournemouth, by Rev. R. A. Chudleigh; No. 13, The Climate and Surroundings of Bournemouth; No. 14, Yarmouth; No. 15, Dinsdale-on-Tees; No. 16, Ilfracombe; No. 17, Lyme Regis; No. 18, Leamington; No. 19, Malvern; No. 20, Buxton and the Peak. Any single number can be had post free by remitting seven stamps to Beaumont and Co., 39, Southampton Street, Strand, London.



for the lover of seclusion and repose, our English climate drives many away to regions where the sun has real power and shines with a persistency that we can hardly conceive.

To the south of Derby, at any rate as far as Birmingham, the country is not remarkable—rather flat, not heavily timbered, and though well cultivated, not tempting to any but fugitives from the crowded alleys of smoky towns, to whom any bit of green, any retired lane is a pleasure. At Derby matters don't mend much, and even if there are some pretty walks near, there is a good deal of smoke, and the place is rather dingy, though clean and prosperous. Directly the town is passed, the country becomes undulating, trees increase in size and number, the railway cuttings become deeper, and the character of the scenery improves, and by the time we reach Ambergate, the junction for Sheffield, we are in the midst of woods, hills, and dales, that prepare us for the beauties awaiting us farther north. On then to Matlock, and getting out there, and crossing the Derwent along the principal street of that charming watering-place, to our left the richly-wooded heights, to our right the irregularly built but picturesque houses of Derwent Parade.

My childhood was passed among people who often mentioned Buxton and Matlock, and I had learnt to associate these familiar names with some of the most beautiful scenes of nature. Fortune, however, did not permit me to pay a visit to them until only a few years ago. The weather in the district in which I live had long been dry, and for weeks we had had dust that would have been a credit to California: hedges, trees, grass, and gardens were fading, and the wells had long run out, when one day, late in August—the 26th it was—I got out at Derby, and next morning at breakfast-time ran on to Matlock and Buxton. The former was just awakening, and I had it pretty much to myself. The rain was descending in sheets: such was my first visit. The wonderful verdure filled me with amazement, and the impression made

on my mind has never been effaced, though I have seen Matlock five times since. Indeed, I fancy that the first time we see a place the impression is of a character and a vividness that no subsequent visit ever adds to or greatly corrects.

On through Matlock—to Cromford, where the rocks become in places precipitous, rising 200 to 300 feet in almost perpendicular elevation. Cromford itself is a dreary little place, with a couple of hundred rather neglected-looking houses, a small unpretending church, and only one object of great interest, Willersley Castle, the residence of the Arkwrights. If the road to the right through Cromford is followed, Wirksworth is reached in an hour, but it hardly offers anything of interest; the church, often the one building of size and beauty in an old English market-town, calls for no remark, while the streets, though in places broad, and offering a marked contrast to the extreme narrowness of some of the older carriage ways, make little impression. A friend of mine, now gone to join the majority, was head-master of the Grammar School, and from him I heard much of the glories of Wirksworth; but my visit to that locality, at a very much later period, hardly came up to my expectation. But near Cromford there is a walk which for beauty, picturesqueness, and variety, is certain to make a deep impression—the Via Gellia, a pretty and retired valley, half a mile or more in length, winding along at the foot of two vast ridges of rocks. The road was cut at the expense of Mr. Phillip Gell, of Hopton, and has a certain far-away resemblance to the Cheddar Cliffs, though while the latter are loftier and more stupendous at their commencement, they lack the fertility and beauty of the Via Gellia. From Matlock Bath a pretty road leads to Matlock Bridge, or the visitor may continue his journey by train, skirting the river, and passing through some tunnels cut under the hills. From here to Miller's Dale the scenery is of the most exquisite

character, and in bright sunshine the peeps along the valleys are, in their way, unlike anything I have ever seen elsewhere. All the way to Miller's Dale, the junction for Buxton, one passes places of interest—Darley Dale, Bake-well, Rowsley, Chatsworth, and Haddon Hall, while Tideswell Church is of noble proportions.

The country rises gradually, and the hills assume a character which tells of thinner soil and greater elevation; but all the same the loveliness of the scenery continues. From Miller's Dale to Buxton the distance is about five miles, and at intervals one sees stupendous masses of precipitous rocks, that would make the fortune of any other part of the country in attracting visitors, but in the Peak district, where all is beautiful, and deep valleys and lofty ridges meet the eye at every turn, no one thinks much of them. Arrived at Buxton, the terminus of the branch, the visitor is struck by the departure from the usual custom. Towns, in times when shelter was important owing to the scarcity of fuel, and the bad workmanship of the houses, were commonly in deep sheltered localities, and it was not till population increased and the conveniences of life became commoner and greater, that building extended up the slopes of the hills. But at Buxton there are two towns; the one, in a deep valley, beautifully sheltered, richly wooded, and admirably built, is perfectly new; the other, of great antiquity and less pretension, is on a lofty bluff, freely exposed to wind, and not verdant with trees. The new town shows many signs of wealth and of large numbers of visitors; its shops are handsome and well filled with goods of excellent quality, and the streets are crowded with people evidently not without leisure and ample means.

Buxton is thirty-three miles north of Derby and 900 feet above sea level, which, in our latitude, is a great elevation, and more completely affects the character of the vegetation than would four times that elevation in the south of Europe. The approach to the town is by a ravine, along which the Derbyshire

Wye flows to join the Derwent. Five miles to the east is Chee Tor, an almost perpendicular limestone rock, rising 400 feet above the Wye.

The baths of Buxton have been famous for 300 years, and the springs supplying them are Calcareous and Chalybeate; the former are mostly tepid, with a temperature of 82° F., but some are cold. During the season, from June to October, the place is visited by many thousands of persons, who stay for a time, while a good many excursionists come up for the day from Derby and Nottingham, and some too from more distant places, like Birmingham, Wolverhampton, Liverpool, and Manchester. Buxton is a very good centre and easy of access.

The waters are largely taken for indigestion, gout, rheumatism, and skin affections.

There is accommodation for 4000 visitors at a time, so that, like Ilfracombe, Bournemouth, and Matlock, it is in the main an invalids' town, with every convenience and attraction for them. It possesses an institution called the Devonshire Hospital, containing a hundred beds and receiving nearly 1,000 persons yearly, who are boarded and treated gratuitously.

The Dukes of Devonshire have had much to do with the rise and magnificence of Buxton. One of the dukes in the last century spent £120,000 in building, not far from the present station, and between the two towns, a stupendous three-storied range of buildings of gritstone, called the Crescent. The central part is a vast curve, extending 200 feet, with wings 58 feet: it contains some hotels, a library, and a few shops. Near the town is Diamond Hill, remarkable for its crystals, and Poole's Hole, a stalactite cavern a quarter of a mile long.

The Romans generally found out any natural water likely to be of service to invalids, and they did not overlook Buxton, and had some baths there.

Among other matters of interest I should add that Mary Stuart lived for a time here when in the custody of Lord Shrewsbury, and all lovers



of Scott (and what educated man would dare to confess that he was not of the number) will remember how large a part of his longest novel—"Peveril of the Peak"—was enacted in the neighbourhood.

The baths, rebuilt some years ago, are considered to be among the finest in Europe, and with justice.

The population is growing fast, and has increased from 3,717 in 1871 to 10,000, while building continues in all directions.

Towns like Buxton largely depend on the perfection and cheapness of their hotels, boarding-houses, and hydropathic establishments. There have been few places with less cause for complaint in this respect; improvement seems impossible, for everything is as good as it can be.

S. U. M.

### RECENT SMALL-POX STATISTICS.

COMPILED by Dr. THRESH, M.O.H., Chelmsford, &c., and based on Dr. Barry's Report on the Sheffield Epidemic.

#### NUMBER OF PERSONS ATTACKED.

Out of every 1,000 unvaccinated children under 10 years, 101 were attacked; out of every 1,000 vaccinated children, 5 only were attacked. Unvaccinated children are therefore 20 times more liable to attack than vaccinated.

Out of every 1,000 unvaccinated persons over 10 years of age, 94 were attacked; out of every 1,000 vaccinated, only 19 were attacked. Over 10 years of age, therefore, unvaccinated persons are 5 times more liable to attack.

#### DEATH-RATE AMONGST THOSE ATTACKED.

Out of every 100 unvaccinated children attacked, 44 died; out of every 100 vaccinated children attacked, only 2 died. A child under 10 who has not been vaccinated therefore is not only 20 times more liable to be attacked, but the attack is 22 times more likely to end fatally. The danger of an unvaccinated child dying from small-pox during an epidemic is

more than 440 times as great as that of a vaccinated child.

Out of every 100 unvaccinated persons over 10 years of age attacked, 54 died; out of every 100 vaccinated over 10 years of age attacked, only 5 died. Therefore unvaccinated persons over 10 years of age are not only 5 times more liable to attack by small-pox, but 11 times more likely to die if attacked. The danger of such a person, if unvaccinated, dying from small-pox during an epidemic is 55 times greater than that of a vaccinated person.

To sum up: during the prevalence of small-pox an unvaccinated child under 10 years of age is 440 times more likely to die of the disease than a vaccinated child. An unvaccinated person over 10 years of age is 55 times more likely to die than a vaccinated person.

### GLYCERINE: ITS MANUFACTURE, PROPERTIES, AND USES.

ALTHOUGH one hundred years have elapsed since the discovery of glycerine by the eminent Swedish chemist Scheele, its value has not been fully recognised for one fourth of that period. Indeed, until some forty years ago, hundreds of tons of this important substance were allowed to run off as waste from the soap works, and to add to the miscellaneous mass of impurities which old Father Thames carries away to the sea. Of course, I do not mean to imply that the waste product in question was glycerine in such a state of purity as to fit it for immediate use; but, at all events, there it was—glycerine, which, if it had been subjected to the various modes of purification now employed, would have possessed a high commercial value.

Its important properties and uses having attracted but little attention, so that what was retained for experimentation was considered simply as so much waste material kept back, instead of being thrown away, it will be well understood that no great amount of care was attached to its production. A sudden revolution

was effected in this respect by the introduction, some forty years back, of a new method of separating glycerine from the other chemical substances with which it is associated. This improved mode of manufacture, devised by an American named Tillman, consisted in the distillation of the oily matter containing the glycerine, at a high temperature with steam.

To fully comprehend the advantages of this process, it is requisite for the reader to revert, for a moment, to the old method by which glycerine was procured. Saponification, in fact, is the admixture of the oils or fats with various bases, which, by their action during boiling, converted the whole mass into a homogeneous, viscid, semi-transparent compound, viz., soap. During saponification, the glycerine is set free from the stearic, margaric, and oleic acids with which it was previous combined, and remains in the liquor, from which it may be subsequently separated.

Glycerine, thus obtained by the ordinary process of saponification, must necessarily be more or less impure, according to the different bases used in the preparation of the soap. By obviating the necessity for their employment, Tillman's process led to the manufacture of a pure, valuable article, which soon became known and appreciated. Tillman's patent was purchased by Price's Candle Company, at whose works glycerine is manufactured on a very extensive scale. The quantity made by them annually is enormous, and every year increases the demand for this important substance. Some idea of the amount produced by this Company may be derived from the fact that, on one visit to their works, I was shown a sample of glycerine taken from a still in which six tons had been made on the previous day. By the introduction of various modifications and improvements, the manufacture of glycerine at Price's Company's works has reached a point of perfection, which it would be difficult to surpass.

The oil used in this process is palm oil, a

fatty substance extracted from the fruit of the *Elais Guiniensis*, a large species of palm found principally in Africa. This fruit, about the size of a nut, consists of a fleshy, oily portion externally, which encloses a solid fatty kernel. Two varieties of oil, which are separately extracted, are obtained from this fruit; that of the outer portion is yellow, always liquid at the ordinary temperature in Africa; that which is expressed from the kernel is white and more solid, and used as an article of food by the natives. The former is the variety chiefly imported to this country. It is nearly of the consistence of butter, and of a deep orange colour, and has a sweet taste and a pleasant aromatic odour.

The following plan is adopted in manufacturing glycerine from palm oil. Steam, at a temperature of 550° to 600° Fahrenheit, is introduced into a distillatory apparatus, containing a quantity of palm oil. The fatty acids take up their equivalents of water, as does also the glycerine, and they are then distilled together into a receiver, where the condensed glycerine, being of a greater specific gravity than the fatty acids, sinks below them, and is gradually removed. If not of the proper density, it is concentrated; if discoloured, it is re-distilled. The best glycerine has a specific gravity of 1.26, and contains 98 per cent. of anhydrous glycerine. Its chemical formula is  $C_8 H_8 O_6$ .

It is unnecessary to dwell upon the superiority of glycerine prepared in this manner over that manufactured by the common processes, in which the glycerine produced is always more or less contaminated by the lime, oxide of lead, chlorine, and other reagents employed for the purpose of separating it from the fatty acids.

In illustration of the care which is exercised in the distillation of glycerine at Price's Works, it may be mentioned that, in the last part of the process, the glycerine is distilled through pipes lined with silver, so as to avoid its contact with any metal which might contaminate the



glycerine. It is also frequently submitted to test in the laboratory, so as to guard against the accidental presence of any impurity.

When pure, it is a colourless, inodorous liquid, of the consistence of a thick syrup, and of a fresh sweet taste. It is soluble, in any proportions, in alcohol and in water. It is not crystallisable, and possesses no influence upon polarised light. It does not absorb oxygen from the air, and, consequently, is not liable to rancidity, but, as it has a great affinity for moisture, it should be kept in closely stoppered bottles. It has no effect upon vegetable colours. It has a more extensive range of solvent power than even alcohol, as it is capable of dissolving some substances upon which the latter has no action.

When acted upon by the weaker acids, no change of composition is effected, but when it is mixed with strong acids, sulphuric or phosphoric acid, for example, increase of temperature takes place, and a new compound, sulphoglyceric, or phospho-glyceric acid, etc., is formed.

Nitro-glycerine, or glonoine, is produced by the action of concentrated nitric and sulphuric acids upon glycerine, at a low temperature. It possesses more powerful explosive properties than any other known substance, having ten times the force of gunpowder. On this account it is employed for blasting in mines.

It is also one of the most dangerous of all explosive substances, and should never be handled except with extreme care, owing to its tendency to undergo spontaneous decomposition, and often to explode upon the slightest friction or shock, when in this condition. To prevent this, it should always be kept dissolved in wood spirit, and other precautions should be taken with regard to its storage, or removal from one place to another. So readily is nitro-glycerine affected by different circumstances, that even a variation of a few degrees of temperature, when making it, is sufficient to modify considerably its purity, explosive properties, and tendency to spontaneous decom-

position. If nitro-glycerine, particularly when impure, is allowed to stand long in a warm room, it is apt to explode spontaneously, without any movement whatever; and this has been known to occur at as low a temperature as  $86^{\circ}$ . The gases produced by its partial decomposition, if confined in a closed vessel, exercise pressure upon the remaining portion of the liquid, and thus increase the liability to explosion upon the least shock. Similar results have also been observed when nitro-glycerine is removed from a cool place to another having a temperature of  $68^{\circ}$  or  $70^{\circ}$ . If, on the other hand, it is kept for some time at a temperature of  $46^{\circ}$ , crystallisation takes place, and the solid crystals are even more prone to explode than the liquid itself.

Many serious explosions of nitro-glycerine have occurred during the few years which have elapsed since its discovery. One of the most notable of these took place in 1866 at Aspinwall, the Atlantic terminus of the railway across the Isthmus of Panama, when a number of cases containing this substance exploded. The vessel, of 1,700 tons burden, in which they were stored, was completely destroyed, as well as another large ship lying alongside; the freight-house, and 400 feet of the quay, were also demolished, several persons were killed, and more than fifty others suffered severe injuries. These, and other casualties with nitro-glycerine, show the necessity either of the most stringent rules in respect to its manufacture, carriage, and use, or of its entire prohibition.

W. A.

*(To be continued.)*

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THE EFFECTS OF PROTECTION IN AMERICA.—The Norway Steel and Iron Company, Boston, Massachusetts, once the largest concern of the kind in the United States, has had to close its works in consequence of the excessive taxation of raw material. Brother Jonathan is apt to make merry at times over the easy nature of John Bull, but, at any rate, the latter has managed to shake off his shoulders fiscal burdens such as those which are paralysing important industries in the States, and are rapidly making that country one of the most expensive for people of moderate income to live in.

## Reviews and Notices of Books.

*The Dietetic Value of Bread.* By JOHN GOODFELLOW, F.R.M.S. Pp. 328. London: Macmillan & Co., 1892.

FOOD is a primary necessity of existence, by reason of the construction of the frame, and the constant need of renovation or reparation of the used-up tissues of the body. Consequently, the instinct and desire for food must have been amongst the first sentiments that animated the human mind. Primitive man doubtless found enough for sustenance, and to supply his simple requirements, in the fruits and seeds readily obtainable, especially in warm climates; but he was not long in recognising the expediency of utilising the latter by storage for consumption at seasons when they would not otherwise be obtainable. To this purpose the cereals—wheat, barley, oats, and rye—were best adapted, and were used as food from the earliest recorded periods. At first eaten in their natural condition as grain, it would not be long before primitive man made the discovery (almost coeval, probably, with that of producing fire), that bruised into a rude form of flour, these cereals could, by mixing the flour with water and exposing the compound to artificial heat, be converted into a kind of cake, more palatable and more nutritious than the plain grain. This was the origin of bread, the “staff of life,” as it is fitly styled, which has ever since constituted the staple nourishment of the poor, and an essential part of the dietary of the rich,—in short, a perfect food when properly prepared, and not deprived of valuable constituents, in order to please the eye or pander to the prejudice of consumers.

Subsequent improvements in the manufacture of bread, and in the grinding of the corn, have been devised from time to time; but, on the whole, there are few handicrafts which have been so conservative in their character, or so

stationary, as that of the bread-baker until of late years. Much of this was without doubt due to the fact that bread was made, not upon any scientific principles, but a sort of rule-of-thumb method; “it was my father’s custom, and so it shall be mine,” might truthfully have been adopted as the motto of the craft.

But science is now invading even the domestic domain, and, to move with the times, the bread-baker must not content himself with the ordinary details of his trade; there are various branches of chemistry and so on, with the rudiments of which he may advantageously make himself acquainted.

“The Dietetic Value of Bread” is an illustration of this fact; for, although it deals largely with the chemistry of food, with physiology, and with hygiene, it is based upon a series of articles originally contributed by Mr. Goodfellow to the *Bakers’ Record*. His book is the most able and complete which has been published on the important subject of which it treats.

The work is divided into six sections. The first concerning food, diet, and digestion; the second dealing with white bread; the third devoted to whole-meal bread; the fourth on special breads; the fifth treating of the diseases of bread from mildew, must, &c.; and the final section relating to the medicinal properties of bread.

Every one will readily admit that bread is the most important of foods, but few can realise the extent to which it forms the staple food amongst the lower classes. In the poor districts of London, Mr. Goodfellow says, the children seldom get any other food; and as the result of personal inquiries which he instituted, it was found that in many localities the children had other food beside bread only once or twice a week. Bread for breakfast, bread for dinner, bread for tea or supper; such was the monotonous bill of fare of the little ones in the very poor districts, like Bethnal Green. The cases inquired into represented about 20,000 children; and the districts were arranged into two



classes, the poor and the better class. The number of meals was counted at 21 for the week, and solid food only reckoned. No account was taken of beverages, or butter; but one may be sure, too sure unfortunately, that the beverages consisted chiefly of washy, innutritious weak tea or coffee, while the butter would be of the commonest quality, and in miserably scanty quantity. How is it that the English poor have such an antipathy to the most wholesome, and at the same time the cheapest, of foods, especially for the young—we refer, of course, to oatmeal? Some will answer that the circumstance of its having been formerly employed, to a larger extent than at present, perhaps, in the dietary of prisons, reformatories, and workhouses, has much to do with this prejudice; but we should seek for the reason in another direction. There is an absence of example on the part of the well-to-do classes. Man is, above everything else, an imitative animal; and so long as those in better position fail to recognise the valuable dietetic properties of oatmeal, so long will people of lower station evince a distaste for this simple dish. There is a fashion in food, as in other mundane matters; and British mothers of the middle and upper classes would not only benefit the bulk of themselves and their children by making porridge an essential at the breakfast table, but would confer a boon on their less fortunate neighbours by aiding, indirectly, in introducing it into their daily dietary. That this is no mere theory may be proved by the extent to which the habit of eating brown and whole-meal bread has increased amongst the lower classes since persons of superior social station and means have adopted the practice. Returning to Mr. Goodfellow's investigations into the food of children in the poor districts of the metropolis, we may quote the following figures:—

Bread only for 21 meals, about 15 per cent.

|   |   |    |   |   |    |   |
|---|---|----|---|---|----|---|
| " | " | 20 | " | " | 15 | " |
| " | " | 19 | " | " | 5  | " |
| " | " | 18 | " | " | 20 | " |

Bread only for 17 meals, about 28 per cent.

|   |   |    |   |   |   |   |
|---|---|----|---|---|---|---|
| " | " | 16 | " | " | 5 | " |
| " | " | 15 | " | " | 5 | " |
| " | " | 14 | " | " | 5 | " |

In better class districts the percentage of children's meals, consisting practically of bread alone as the solid portion, was, of course, not so striking; yet, even in these, the percentage was sufficiently marked to demonstrate the paramount necessity of good, wholesome bread.

The body is so constituted that it cannot assimilate as food simple chemical substances or elements. For instance, we could not feed on the nitrogen which is contained in ammonia, the carbon of coal, or hydrogen in its gaseous condition. The elements must be supplied in some combined form, capable of being broken down into simpler compounds by the process of digestion. The principal duties of food are to perform one or more of the following functions: (1) to maintain the heat of the body; (2) to supply the force for performing work; (3) to renew wasting tissues; (4) to supply materials for building up new tissues; consequently, the author gives the definition, "a food is a substance which is capable of performing any or all of these functions."

The food materials present in bread, or resulting from its digestion, are albumin and gluten (nitrogenous compounds, flesh-formers), and starch, dextrose, maltose, dextrin, vegetable fat—containing carbon, hydrogen, and oxygen in different proportions, and thence called carbo-hydrates (fat-formers, and heat-producers), with various mineral salts. Starch is very widely distributed throughout the vegetable kingdom, and found in the form of "starch grains," minute bodies stored up in certain parts, such as the tuber of the potato and the seeds of the cereals. Their size varies considerably, according to the plant they are found in, and, as is well shown in the accompanying illustrations, they present, when examined by the aid of the microscope, characteristic shapes peculiar to the species of plant from which they are obtained.



FIG. 1.—STARCH GRANULES FROM THE POTATO, SHOWING THE HILUM AND LAYERS. (Multiplied 300 diameters.)



FIG. 2.—STARCH GRANULES FROM RICE. *a*, Part of the grain showing the granules *in situ*; *b*, isolated granules. (Multiplied 300 diameters.)

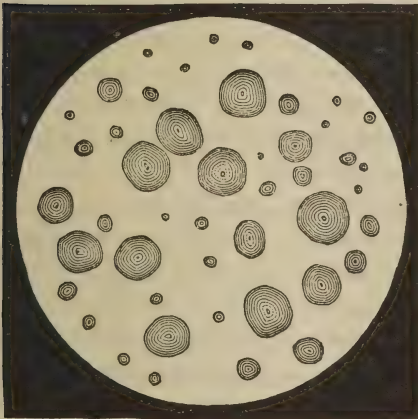


FIG. 3.—STARCH GRANULES FROM WHEAT. (Multiplied 300 diameters.)



FIG. 4.—STARCH GRANULES FROM RYE. (Multiplied 300 diameters.)

STARCH GRANULES FROM THE POTATO, FROM RICE, FROM WHEAT, AND FROM RYE.

(Illustrations taken, by permission of Messrs. Macmillan and Co., from "*The Dietetic Value of Bread.*")



Since man cannot long exist without a dietary which includes both carbon and nitrogen, it is evident that his food must comprise representatives of these elements, to replace the carbon and hydrogen daily eliminated from the system. In order to sustain a healthy condition, a full-grown man doing a fair day's work requires about twenty-four ounces of dry solids, and eighty ounces of water in the course of twenty-four hours. Of the eighty ounces of water, one-fourth will be contained in the ordinary food, leaving the amount to be made up by beverages at sixty ounces. As regards the dry solids, the twenty-four ounces (which would be represented by double that quantity of moist food) would, in round numbers, comprise five ounces of albuminoids, fifteen ounces of carbo-hydrates, three of fat, and one ounce of mineral salts—common salt (chloride of sodium), and the salts of potash, lime, etc. The long withdrawal of any of these constituents from the food would lead to an impaired state of health; while, on the other hand, an excessive amount of any of these constituents would tend to disease, *e.g.* albuminoids (as in the case of persons eating too much meat) in excess would conduce to gout and kidney affections. It is a curious fact that foods such as milk and bread, containing all of the principles requisite for a healthy dietary, never produce satiety.

The kinds of flour obtained by grinding the grain of wheat are classified by the author, as follows:—1. Flour made from the central portion of the grain, very finely ground, known as "fine flour"; 2. Flour obtained from the outer portions of grain as well as from the central portion, not so finely ground, called "fine sharps," "medium," or "seconds"; 3. Flour procured from the entire grain, designated "whole-meal flour. The principal difference between these varieties of flour rests in the amount of nitrogenous matter and salts which they contain, the percentage of both increasing, while that of the carbo-hydrates (starch, etc.)

decreases, as we pass from fine flour to the whole-meal kind.

| Components.                                 | Fine Flour. | Medium. | Whole-meal. |
|---------------------------------------------|-------------|---------|-------------|
| Water ... ..                                | 12.0        | 13.0    | 14.0        |
| Proteids (albumin, etc.)...                 | 9.3         | 12.1    | 14.9        |
| Nitrogenous ... ..                          | 0.8         | 0.9     | 1.6         |
| Carbo-hydrates (starch, sugar, etc.) ... .. | 76.5        | 72.2    | 66.2        |
| Fat ... ..                                  | 0.8         | 0.9     | 1.6         |
| Mineral matter ... ..                       | 0.7         | 0.9     | 1.7         |
| Fibre ... ..                                | 0.7         | 0.9     | 1.6         |

It will be noticed that the ratio of mineral salts and of fat increases as we pass from fine flour to whole-meal. From the foregoing analysis it will readily be seen that for a man who has to sustain a fair amount of exertion, and especially whose dietary is limited, by reason of his slender means, bread made from the coarser sorts of flour is indicated. In the case of persons otherwise situated, the relative deficiency of nitrogenous matter and of mineral salts will probably be made up by the use of other articles of food. "On no account," however, says the author "should white bread form part of the diet of infants or children, unless supplemented by milk or other foods rich in lime and phosphates, for they require especially phosphate of calcium to form their bones and teeth, and to promote the growth of new tissues."

The chapter on flavour and other points is interesting, and the author rightly insists on the desirability, not only of using good flour and other ingredients, but of properly baking the bread. The flavour of new bread differs, as all know, from that of stale bread, though it is not so easy to give the exact reason. The loss of water by evaporation has something to do with it, and it appears probable, also, that some molecular change occurs in connection with the the carbo-hydrates. Mr. Goodfellow mentions the popular idea that toasted bread "dries up the blood," on which account many people take it sparingly. This common notion should be dismissed as a fallacy. Toasted bread does not act injuriously upon the body in any way, and it is more easily digested

than ordinary bread, owing to its containing a greater percentage of soluble carbo-hydrates; the ingestion of which with the food facilitates digestion.

It is very satisfactory to learn that the author has deduced from numerous examinations of bread, that it seldom forms the subject of adulteration. Out of 341 samples of London bread, 333 were found to be pure, 3 contained alum, and 5 gave evidence of the presence of other flours than that of wheat. Of these five samples, 3 were adulterated with ground rice, and 2 with common arrowroot. The samples from the provinces numbered 194; 189 were pure, 2 were adulterated with alum, and 3 with ground rice. The author gives us one reason why the addition of alum, once so prevalent, has been nearly done away with, namely, that as people have become more educated in food reform, they do not regard extreme whiteness as a test of quality in bread, so much as the flavour and the satisfying power. Either rice or potato starch added would lower the nutritive value of bread; in the first place by causing more water to be taken up, in the second by reducing the nitrogenous ratio.

Very little whole-meal bread was eaten in England until a few years ago; for "brown bread," as it was styled, consisted mainly of a mixture of white flour and bran, thus making a loaf inferior in nutritive value to the usual white loaf. Whole-meal is produced by grinding the entire grain, so that the flour retains the outer layers. These are particularly rich in albuminoids (nitrogenous materials) and phosphates, and to this circumstance is due the fact that whole-meal bread, as has been pointed out, is richer in these important substances than white flour is. But the author is careful to indicate the necessity of having the meal properly prepared. Otherwise, the large bran particles, being indigestible, lock up the valuable nitrogenous matter, and render it impossible for the digestive juices to act upon it; the phosphates are similarly prevented from

being taken into the system, and the nutritive ratio is further diminished. Moreover, large, hard particles of bran are apt, by irritating the lining mucous membrane of the intestines, to induce diarrhoea and subacute inflammation of the bowels. The waste material of ordinary whole-meal bread, i.e., bread made from whole-meal ground in the ordinary way, is about 12½ per cent.; this waste represents undigested material, chiefly in the form of woody fibre, nitrogenous material, fat, and mineral salts.

Many persons object to the flavour of whole-meal bread. The author points out that this is not so much owing to the taste, as to the unpleasant irritation to the tongue and mouth, caused by coarse, flavourless particles of bran, from which a feeling of dislike arises. "If," Mr. Goodfellow writes, "the general public are ever to be induced to eat more freely of whole-meal bread, it will be done by supplying them with better flavoured whole-meal bread, produced by the use of *finer* grades of whole-meal, and by quick fermentation." In short, the more universal adoption of whole-meal bread rests with the miller and the baker.

The conclusions at which the author has arrived concerning the dietetic value of fine whole-meal bread, is that it is of particular utility to persons suffering from constipation, to those who are inclined to put on flesh too rapidly, to nursing mothers, and in the case of children above the age of ten months (up to which period it is not suitable), to those who show a tendency to rickets and other developmental diseases, and to decay of the teeth.

The special breads described are those known as aerated, malted, triticumena, cyclone, germ, Fletcher's diastase, frame-food, gluten, Black's patent fermented, Seatree's, dorase, lentilalmo, Clarkson's home-made, aleuronate, malto-peptone, rizine, and Best's germ malt bread. Our review has already reached such limits that we propose to deal with these in a subsequent notice.



## NOTICES: ANALYTICAL AND HYGIENIC.

**KUTNOW'S SPECIALITIES**.—Improved Effervescent Carlsbad Powder; Anti-Asthmatic Powder.—Under these names, Messrs. S. Kutnow and Co. have introduced two special preparations, both of which have received high commendation from the medical press and profession. The first-named is a decided improvement upon the Carlsbad Salts, commonly sold, and against which various objections have been urged, on the ground of their unpalatable flavour, and other drawbacks, being actually compounded of the well-known Carlsbad Salts, in combination with additional ingredients, rendering it pleasant to the taste and more efficacious. Kutnow's Effervescent Carlsbad Powder is an excellent saline aperient, particularly indicated in the treatment of affections of the liver, stomach, and kidneys, and of the numerous ailments more or less dependent on derangements of those important organs, such as gout, rheumatism, and hæmorrhoids.

Kutnow's Anti-Asthmatic Powder is composed of a judicious admixture of various herbs possessing a sedative, soothing action upon the lungs and air-passages, with potass nitrate. We should note that neither lobelia nor datura tatula, both of which are very lowering in their effect, and liable to cause heart complications, are permitted to find place in this preparation. We have experienced excellent results from prescribing Kutnow's Anti-Asthmatic Powder in asthma, chronic catarrh, and analogous disorders, always difficult to remedy by the ordinary methods of medication. When a small teaspoonful of this powder is put into a saucer and well ignited, the asthmatic sufferer obtains speedy relief from inhaling the fumes, no matter how severe the paroxysm or how long the patient has been a victim to this most distressing affection.

**SIR JAMES MURRAY AND SON'S FLUID MAGNESIA**.—We have to deal here with a remedial agent which is a very old and well-tried acquaintance. We have known it for forty years, always pure in quality, uniform in strength, and certain in action; characteristics which have naturally resulted in making it a general favourite with medical men and invalids, while its universal success has caused worthless imitations to spring up. Recent analysis of Murray's Fluid Magnesia show that it contains a pure solution of magnesium carbonate (7·61 grains to the ounce), with free carbonic acid. It is equally as well adapted for children and the most delicate women as for more robust adults requiring an occasional antacid aperient.

**AMERICAN BRAIDED WIRE** is a manufacture which is rapidly coming into wide and fully deserved repute. Its applications are numerous, such as for seats of chairs and carriages, and all uses where a light, elastic material is required, as, for instance, pillows. We can speak personally on the merits of American braided wire in this last-named respect. Some time ago we sustained severe injury to the head and neck through a railway collision; and ever since we have suffered from pain, stiffness, heat, and discomfort of the muscles of the neck at night. The American braided wire pillows were brought under our notice, and we have used one since then, discarding the ordinary pillow, with great relief to the previously distressing symptoms and with marked improvement in health and comfort. The braided wire pillow is light, cool, and resilient; persons using it, whether they be healthy or invalid, would think thrice, as Mr. Gladstone once said with reference to a great political step, before substituting any other for it.

## Notes and News.

**INSTITUTE OF CIVIL ENGINEERS OF IRELAND**.—A meeting was held last month in their new hall, 35, Dawson Street, Dublin. A paper was read by Mr. W. Kaye Parry, M.A., on the "Sewage Disposal of Isolated Dwellings." The author described and illustrated with diagrams several drainage and sewage disposal works which he had carried out, including those at the work-house, Loughlinstown, co. Dublin, for the Guardians of the Rathdower Union, at Carton, Maynooth, co. Kildare, for his Grace the Duke of Leinster, and at other places.

**BUTTER**.—The consumption of butter in this country is at the ratio of 13 lbs. per head, as compared with 8 lbs. per head of the population in Germany, 6 lbs. in Holland, 4 lbs. in France, and only 1 lb. in Italy. The value of the butter consumed last year amounted to £10,000,000, to which should be added £4,000,000 more for margarine; and as the bulk of both articles came from abroad, it would appear that dairy-farming might be profitably conducted in England to a much larger extent than at present.

**PRISONERS' SPECIAL DIET**.—It is customary on the reception of prisoners in England and Wales to supply them with a special diet by way of leading them up to the ordinary prison dietary. Mr. Matthews has just revised the bill of fare, issuing instructions whereby prisoners on the first day of their incarceration shall have for breakfast eight ounces of bread and a pint of cocoa; for dinner 12 ounces of bread with four ounces of American beef or mutton; and for supper eight ounces of bread and a pint of porridge. This diet is served out to prisoners on the first day, whether they be on remand, awaiting trial, or upon conviction.

**LIGHTNING CONDUCTORS** are excellent things when they are in perfect order, but when the opposite condition exists they are a delusion and a snare. Mr. Alfred Hands, of the Meteorological Society, has recently stated that at least seventy per cent. of the lightning conductors in this country are in an unsatisfactory state. One very common error is that the rod instead of entering the ground, terminates at some little distance above the surface. The dangers of lightning will be duly appreciated when it is mentioned that during seven months of 1891 more than two hundred buildings were struck by lightning in England, including 21 churches and chapels. Within the same period 18 men and women lost their lives through the same cause, while 35 horses, 94 cattle, and 153 sheep were also killed.

**"FOGS CLEARED AWAY BY CONTRACT"** bids fair to become the latest development of practical science, judging from the fact that recent experiments in Boston Harbour (U.S.A.) relative to clearing fogs by means of electric discharges have resulted in the absolute annihilation of dense fog over an area of two acres. But the longest time that the atmosphere has remained free from fog after each discharge has been seven minutes, the aqueous vapour pouring in again from all sides to refill the freed space. No detonation or explosion accompanies the discharge, the precise nature of which is kept a profound secret by the inventor. The experiments were conducted from the deck of a steamer, and it was found that by delivering a succession of discharges at intervals of two minutes, the above-mentioned area round the vessel was kept practically clear of fog. The inventor is at work in New York completing the details.

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## SPECIAL NOTICE.

*Beaumont and Co., Limited.*—In accordance with the wishes of numerous friends, arrangements have been completed, as will be seen on reference to our advertising columns, for the conversion of the firm of Beaumont and Co., established in 1873, into a company, under the Limited Liability Act. This step involves, of course, the transfer to the new proprietary of *HYGIENE*, amongst other valuable copyright publications. But the conduct and editorship of that journal will remain in the same hands, which will be greatly strengthened by the circumstance that the new proprietary includes many persons interested in sanitary matters, as well as directly concerned, by reason of their being shareholders of Beaumont and Co., Limited, in promoting the further success and well-doing of their own paper. The Board of Directors have decided upon issuing a portion only of the shares, that being sufficient to provide for current working expenses and the purchase of the business and stock. As the issue will be a private one, all who intend to take shares in this promising concern should, without delay, forward their applications to the Secretary, at the Company's registered offices, 39, Southampton Street, Strand, London, with cheque or postal order crossed "London and Midland Bank," the Company's bankers.

## DIFFICULTIES MET WITH IN ATTEMPTING TO PUT IN FORCE THE "HOUSING OF THE WORKING CLASSES ACT" IN RURAL DISTRICTS.

By J. C. THRESH, D.Sc., M.B., D.P.H., M.O.H.  
Chelmsford and Maldon Rural Sanitary Districts.

THE consolidation in the one Act of 1890 of the numerous Acts of Parliament bearing upon the housing of the working classes has caused much greater attention to be paid to this subject both in urban and rural districts, and clause 30 (Part II.), by imposing upon every medical officer of health the duty of making representations to his authority as to any dwelling-house which appears to him to be unfit for human habitation, has resulted in many such houses being condemned, and either put in proper repair or closed under this part of the Act; and in one or two rural districts the desirability of adopting Part III., in order to provide better accommodation for the working classes, has also been considered.

Parts II. and III. alone are applicable to rural sanitary districts, the former referring chiefly to the condemning of unhealthy dwelling-houses, and the latter to the provision of lodging-houses or cottages for the labouring classes, and I shall confine my present remarks exclusively to the difficulties met with in rural



districts in attempting to put in force the above sections.

In my own county (Essex) the medical officers of health have made numerous representations to their authorities under Part II., but the results have not, in many cases, been so satisfactory as could be desired.

In large towns the closing of a few dwelling-houses is a matter of little importance, since there are usually other unoccupied houses sufficiently near into which the evicted tenants may move. In our villages the condition is very different, our greatest, or one of our greatest, difficulties being to find better houses for the people displaced. The Act, though providing for the condemnation and closure of insanitary houses, makes no provision for housing the families turned out, unless the sanitary authority adopts the third part of the Act, and proceeds to erect cottages to supply the demand. But supposing there were no difficulties in the way of doing this (and unfortunately there are many), this is a remedy which requires a considerable amount of time, and meanwhile Part II. must very often remain a dead letter. In one district with which I am acquainted closing orders were made in respect to several dwelling-houses, and resulted in great hardship being inflicted upon the tenants. One family, at least, had to move into an adjoining parish, yet the man's employment was in the village he had left, and he had two allotments in the same parish. As he was unable to find a house at liberty in his own village, he did not move out of the condemned house until summoned before the magistrate and threatened with a heavy daily penalty in default. Afterwards, when he made a claim upon the rural sanitary authority for some slight compensation (Sec. 32-3), the guardians were unable to grant any, and the clerk said that if he applied to the magistrate he did not think he would get any.

In our agricultural districts, many of the inhabited houses are so structurally defective,

and in such a wretched condition, that the owners acknowledge that the most economical way of making them habitable is by pulling them down and rebuilding them; but, rather than do this, as soon as the sanitary authority serves notice upon them according to Form A, schedule 4, the tenants are turned out and the cottages closed. This has been done with such alacrity in some instances, and has resulted in such serious inconvenience to the poor people evicted, that I have now to consider something more than the mere question of habitability before condemning a house; otherwise my zeal to enforce the law would often result in my doing more harm than good. A great many of our worst cottages are copyhold, and the copyholder knows that in proportion as he increases the value of his property, in the same proportion is he increasing the fines payable to the lord of the manor, and naturally his strong objection to this leads him to spend the smallest sum possible on his cottages. I have had several lots of copyhold cottage property offered me as a gift if I would accept them, pay the fines, and put them in habitable repair. It is an admitted fact that numbers of such cottages now tenanted when offered for sale do not obtain bids which, if accepted, would pay the costs of the lawyers and auctioneers. Add to this the fact that very many of the owners of these small copyhold properties are themselves only just above the pauper class, and one may in a measure realise the difficulties which have to be contended with in dealing with them. Such difficulties are not, however, always insurmountable, as the following example will show. I had to represent as unfit for human habitation four cottages owned by an aged couple, whose income was entirely derived from the rents thereof. They lived in a small cottage which was also their own. All were copyhold, and mortgaged for £100. The mortgagee had to take possession of the five cottages, and he sold the lot for £50. The lord of the manor enfranchised them without fee or

fine. Two of the cottages have since been pulled down as they were past repair, and the others are being rendered habitable. The poor old couple have found friends who will provide for them for the very short time they may be expected to survive. Had it not been for the kindly interest of the clergyman of the parish and the lord of the manor I do not know what could have been done in this case.

Not only are these poor owners unable to repair, but they are unable to pay the interest on the cost of repairs. Under section 36 an owner, after making repairs, can obtain a charging order charging on the dwelling house an annuity to repay the amount expended. The annuity is £6 per cent., payable for a term of thirty years. Where, however, is the money to be obtained on such terms, on such security, especially if the property be copyhold? To repair properly many of the structures which pass for dwelling-houses in our rural districts would cost so much that the annuity made by the charging order would absorb all the rent. The owner prefers to close them at once, and save both trouble and expense. Even were he desirous to repair, I have not been able to find any one willing to advance the money on such terms, nor is it ever likely that any private individual will. Until, therefore, some public funds are available, this part of the Act is likely to remain a dead letter so far as our rural districts are concerned.

Another difficulty occurs when the tenants are too poor to pay any rent, and the landlord is sufficiently generous to make no claim. Unless very philanthropic, he feels that, under the circumstances, he is not called upon to expend anything in repairs. Such cases are not uncommon. In a report on the housing of the working classes in my district I give, as an instance, an aged couple who reside in a ruinous building. By patching the walls with paper, and making screens of sacking, they have made two rooms fairly comfortable. The man is seriously ill, and cannot live long. Both implore

me not to condemn the place, as they infinitely prefer living there to being removed to the workhouse. What if some cold morning the man is found dead in bed, and the coroner and his jury visit the house? Shall I be censured, and will my sanitary authority be held up to obloquy in the public press? Possibly so, yet I cannot find it in my heart to recommend the authority to take any action in the matter, and I accept the responsibility, guarding myself, as far as possible, by periodic visitations.

Under section 32, proceedings can be taken, whether the house represented as unfit for habitation be occupied or not, and a closing order obtained, and a penalty not exceeding £20 may be imposed.

When, upon the receipt of the first notice from the rural sanitary authority, an owner voluntarily closes the house represented to be unfit for human habitation, the authority invariably considers it unnecessary to take any further proceedings.

There is no power to compel the owner of the house to put it in tenantable repair, nor have the sanitary authority power to do the necessary works and make a charging order payable to themselves.

No doubt Part III. of the Act was intended to afford a means whereby the rural sanitary authority could provide cottage accommodation where such was really wanted. The mode of procedure, however, is so elaborate, and in almost all cases costly, as to render it impossible, except under the most favourable circumstances, for any authority to provide suitable cottages at a low rent—that is, at a rent payable by an agricultural labourer, unless they at the same time impose a considerable additional burden on the rates.

In the first place Part III. can only be adopted in rural districts by the consent and certificate of the County Council, and the County Council can only grant a certificate after holding a local inquiry, a separate inquiry and certificate being necessary for each area in



which additional accommodation is considered to be required. The certificate being granted and adopted, land must be acquired upon which to build the cottages, and sections 175 to 178 of the Public Health Act, 1875, must be complied with. The routine, therefore, is:—

1. Resolution of Board of Guardians.
2. Preparation of scheme.
3. Notice to every owner or reputed owner, lessee or reputed lessee, and occupier of any part of the area comprised in the scheme.
4. Petition to the Local Government Board.
5. Local inquiry by Local Government Board.
6. Order by Local Government Board sanctioning the scheme.

7. Local authority may purchase land by agreement—*i.e.*, at the landlord's own price.

If the authority will not pay each landlord and lessee what he asks, the additional procedure is as follows:—

8. Notice in *London Gazette*.
9. More notices to owners in every part of the area.
10. Any owner may petition the Local Government Board.

11. If such petition is presented and not withdrawn, the order of the Local Government Board requires an Act of Parliament to confirm it, and the Bill may be opposed both in the House of Commons and House of Lords.

12. Finally, the price of land must be fixed by arbitration, according to the Lands Clauses Consolidation Acts.

No rural authority, I am afraid, will ever persevere to the bitter end, for if they were determined to acquire the small amount of land necessary for a few cottages with gardens, it would be much cheaper to pay the owner several times its real value than follow out this costly mode of procedure.

Up to the present time only one Board of Guardians has attempted to put in force Part III of the Act. Last year I raised the question with reference to a village in one of my districts in which increased cottage accommodation is

much needed. Very little investigation by the clerk and others interested drove them to the conclusion that it was hopeless attempting anything under this part of the Act. In the Thingoe Union of West Suffolk an attempt has been made to do something towards providing a few cottages for the village of Ixworth, and as this is the first experience of its kind, an outline of the proceedings from the commencement up to the present date may be worth recording.

Early in 1891 the Ixworth Labourers' Association petitioned the Thingoe Rural Sanitary Authority to erect a few cottages in that village, representing that additional accommodation was urgently required. The authority petitioned the West Suffolk County Council, and early in June Lord F. Harvey held an inquiry at Ixworth on behalf of the Council. As it was suspected that the rural authority would adduce little, if any, evidence to prove that such accommodation was necessary, I was requested by the Labourers' Association to visit the village and advise them what course to pursue. A legal adviser and barrister had already been engaged by them. Before opening the inquiry Lord F. Harvey made a personal inspection of all the worst property. As had been anticipated, the rural authority merely stated through their clerk why they had asked for this inquiry, and the medical officer of health and sanitary inspector gave evidence as to the condition of certain cottages which had recently been represented as unfit for human habitation. The Labourers' Association, however, had no difficulty in satisfying Lord F. Harvey on all the points of the inquiry, *viz.*:—

1. That additional accommodation was necessary.
2. That there was no probability of such accommodation being obtained by private enterprise.
3. That it was prudent for the authority to undertake the provision of the said accommodation.

As the rural sanitary authority had not asked for the burden of expense to be limited to any one or more contributory places, it was taken for granted that such expense would be borne by the whole of the district. There was practically no opposition, and in due course Lord F. Harvey reported to the County Council that in his opinion further accommodation was necessary, etc. Before this stage had been reached, however, the Thingoe Guardians decided that it was desirable to limit the expenses incurred in connection with the execution of the Act to the parish of Ixworth and five other parishes immediately surrounding it. They therefore petitioned the County Council to hold another inquiry to determine this point. The County Council consented, and on September 24th Colonel Pocklington held the second inquiry. It was then discovered that Colonel Pocklington had no power to limit his inquiry to this one point, and it was arranged that a third and full inquiry, after service of necessary notices, etc., should be held. On October 9th Colonel Pocklington presided over the third inquiry, and again the rural sanitary authority made no attempt to prove their case. The Labourers' Association, being advised that Lord F. Harvey's report could be tendered as evidence, made no special arrangement for the attendance of witnesses. The result was that Colonel Pocklington reported to the County Council that there was no proof of the necessity for further accommodation for the housing of the working classes at Ixworth. The County Council had now before it two diametrically opposed reports, and to crown all, the rural sanitary authority, who alone were responsible for the deadlock, passed a resolution regretting the inability of the County Council to grant them the necessary certificate. This protestation of anxiety on the part of the guardians for the welfare of the labourers, when by their own misguided action they had, as was thought, effectually disposed of the "certificate," reminded a writer to the local press of the lines in Kemble's "The Panel,"

Perhaps it was right to dissemble your love,  
But why did you kick me downstairs?

However, on February 9th of this year, the County Council decided that a certificate should be granted on Lord F. Harvey's report, and it now remains to be seen what the guardians will do with the power conferred upon them. The considerable expenses incurred so far have been borne chiefly by private individuals. The proposal to limit the burden of expense to a few parishes caused a considerable amount of opposition to be raised to the granting of the certificate, and if this opposition is kept up and land has to be acquired compulsorily it is almost certain that by the time the land is purchased the money expended will seriously increase the cost of the cottages.

The first attempt to put in force Part III. of the Housing of the Working Classes Act has not met with such a degree of success as to encourage other sanitary authorities to follow the example of the Thingoe Guardians, especially when we consider that other and still greater difficulties have to be overcome before the Ixworth labourers get their cottages.

The Act is altogether too cumbersome. It is preposterous to hedge round the provision of half-a-dozen or a dozen cottages with so many obstacles. The framers of the Act must have been under the impression that unless rigorously restrained, boards of guardians would at once commence to erect cottages all over the country, whereas the fact is that even had facilities been furnished for carrying out such improvements in the housing of the labouring classes, the guardians could have been trusted not to dive too deeply into their own and fellow-ratepayers' pockets. In most cases it would, under the most favourable circumstances, require not only the oft-repeated advice of their medical officers, but a good deal of outside pressure, to get them to move. In my own districts the sanitary authority have given this matter their careful consideration, and I believe they would have endeavoured to provide cottage accommodation



in certain of our worst villages had there been any prospect of their being able to do so at a reasonable expense. I am still hoping to obtain cottages in one or two parishes, but if I am successful, it will be because the landowners and others concerned second my efforts, and aid in removing the obstacles in the way. Land must be obtained at a very low price, and by agreement, and all opposition entailing expensive inquiries will have to be avoided. Of course there would rarely be any necessity for such action were the landowners compelled to provide cottage accommodation for all the labourers employed on their farms. At the present time agriculture is so depressed in many counties that the owners cannot afford to provide this accommodation, and very few of them seem disposed to avail themselves of Ritchie's Act, the Improvement of Land Act, and the Settled Land Acts. Under these Acts the Public Loans Works Commissioners are empowered to advance money to landowners for the construction or improvement of dwellings for the working classes. The amount not to exceed half the value of the lands and buildings, the rate of interest not to exceed  $3\frac{1}{8}$  per cent., and the loan to be repaid in forty years.

If these clauses were made compulsory, the difficult question of housing the labouring classes in our rural districts would be solved and the burden—if any—would be laid upon the right shoulders. Farmers would have better supplies of labourers if they had better cottages, and they would thus recoup themselves for any little additional rental on their farms.

Still more important, probably, is the necessity for obtaining powers to enable rural sanitary authorities or County Councils to pull down and re-erect, or to place existing insanitary cottages in habitable repair, and to recover the expenditure by a charging order on the improved property.

The Ixworth inquiry also demonstrated the necessity for each County Council having its own medical officer of health to assist them in making

inquiries into the requirements of their districts for increased cottage accommodation. Had the West Suffolk County Council had a medical officer of health who could have reported to them on the condition of Ixworth, there would in all probability have been no conflicting reports presented to them by the gentlemen who held the official inquiries, and up to the point of granting the certificate, fewer difficulties would have been encountered, while the way would have been smoothed for further action.

The conclusion at which I have arrived, from a careful study of the parts of the Acts especially referred to, and of the attempts which have been made in my own and other districts to execute them, is that under the most favourable circumstances they may be productive of much good, but that, unless the circumstances are very favourable, they will fail entirely to effect the object in view—the better housing of the labourers in our rural districts.

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## THE SKIN.

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BY SIR ALFRED POWER, K.C.B.

THERE's a skin without, and a skin within,  
A covering skin and a lining skin;  
But the skin within is the skin without  
Doubled inwards and carried completely throughout.

The palate, the nostrils, the windpipe and throat,  
Are all of them lined with this inner coat,  
Which through every part is made to extend,  
Lungs, liver, and bowels, from end to end.

The outside skin is a marvellous plan'  
For exuding the dregs of the flesh of man,  
While the inner extracts from the food and the air  
What is needed the waste of the flesh to repair.

Too much brandy, whiskey, or gin,  
Is apt to disorder the skin within,  
While if dirty and dry the skin without  
Refuses to let the sweat come out.

Good people all, have a care of your skin,  
Both that without and that within,  
To the first, give plenty of water and soap,  
To the last, little else but water, we hope.

But always be very particular where  
You get your water, your food, and your air,  
For if these be tainted, or rendered impure,  
It will have its effect on the blood be sure.

The food which will ever for you be the best,  
Is that you like most and can soonest digest,  
All unripe fruit and decaying flesh  
Beware of, and fish that is not very fresh.

Your water, transparent and pure as you think it,  
Had better be filtered and boiled ere you drink it,  
Unless you know surely that nothing unsound  
Can have got to it over or under the ground.

But of all things the most I would have you beware  
Is breathing the poison of once breathed air;  
When in bed, whether out or at home you may be,  
Always open the windows and let it go free.

With clothing and exercise keep yourself warm,  
And change your clothes quickly if caught in a storm,  
For a cold caught by chilling the outside skin  
Flies at once to the delicate lining within.

All you, who thus kindly take care of your skin,  
And attend to its wants without and within,  
Need never of cholera feel any fears,  
And your skin may last you a hundred years.

### GLYCERINE: ITS MANUFACTURE, PROPERTIES, AND USES.

*(Concluded from page 186.)*

THE impurities existing in improperly prepared glycerine result from two sources: 1,—Incomplete purification; 2,—Adulteration.

If water has been added, having been introduced by the retail seller for the purpose of diminishing its commercial value, the specific gravity will at once show the adulteration. The best glycerine, as has been mentioned in an earlier part of this article, has a specific gravity of 1.26, when it contains only 2 per cent. of water; at a rather lower specific gravity, namely, 1.24, it contains 4 per cent. of water.

The impurities most frequently met with in badly prepared glycerine are,—the volatile fatty acids, oxide of lead (litharge), lime, different metallic bases, chlorine, and sulphuric acid.

If a small quantity of glycerine, containing the volatile fatty acids, be poured into the palm and rubbed between the hands, a peculiar fetid, mouse-like odour will be evolved.

The presence of lime may be readily detected by the addition of a solution of oxalate of ammonia. The lime is thrown down in the form of an abundant white precipitate of oxalate of lime.

The addition of a solution of nitrate of silver generally produces a precipitate with all specimens of glycerine, except Price's. This is owing to the circumstance that chlorine has

been employed to bleach the glycerine, so as to make it look colourless and pale, or it may arise from the existence of chlorides in the water, which is combined with the glycerine.

If sulphuric acid or sulphates be present, the fact will be ascertained in a similarly easy manner by adding to the glycerine a solution of the chloride of barium, or of the nitrate of baryta; the precipitation of a white substance, sulphate of baryta, insoluble in nitric acid, results if any of the impurities belonging to this group (the sulphates) exist in the glycerine.

Glycerine is frequently adulterated with grape-sugar (glucose), or with syrup made with common sugar, honey, or treacle, the object in view being to imitate the sweet taste of pure glycerine, or to disguise other impurities. To detect the adulteration of grape-sugar, a small piece of caustic potash should be boiled in a test-tube with some of the glycerine; this, if impure, turns almost immediately to a dark brown colour.

Common cane sugar is not soluble in glycerine but the latter can hold in suspension about 10 per cent. of syrups of sugar, treacle, or honey. The detection of adulteration with saccharine matter, may be effected by the polarimeter, as pure glycerine has no action upon polarised light, while the ray is diverged to the right if cane sugar or glucose exist in the fluid. Chemically, the presence of either cane or grape sugar may be ascertained by mixing the glycerine with a solution of sulphate of copper, and then adding a solution of caustic potash, in excess. In the event of adulteration by either of these substances, a deep blue colour is produced. The solution containing cane sugar retains its blue colour for some time, only a small quantity of reddish powder (sub-oxide of copper) being thrown down. If heat is applied to the solution in which grape-sugar is contained, an abundant greenish precipitate, rapidly changing to scarlet, and subsequently to red sub-oxide of copper, is produced, and the solution resumes its original colourless condition.



The uses of glycerine are so numerous, that it would be impossible to enter into full details concerning them, without too great encroachment upon the pages of this periodical. I shall, however, briefly touch upon the principal purposes for which glycerine is employed.

In surgery, as might be expected from its bland, unirritating, and emollient nature, glycerine is especially useful. There is no remedial agent at all equal to glycerine in the treatment of burns, scalds, chaps, chilblains, and other local affections of the surface of the body. In these cases it may be applied, either in the simple form, or in a state of admixture with various other substances, capable of exerting a salutary action upon the diseased tissues. To the medical or chemical reader these substances will readily suggest themselves. Glycerine readily dissolves nearly every remedial agent of any value, and from the remarkable power of penetration which it possesses, it increases the efficacy of the substances with which it is combined. In the majority of cases of the class referred to, it will be found sufficient to apply only the pure glycerine, unless the irritation or pain renders desirable the addition of a sedative, or the slow process of healing necessitates the employment of a more stimulating application than glycerine itself. The glycerine thus applied, for example to a burn, acts beneficially in two ways, viz., 1st, by protecting the injured surface of the skin from contact with the air; and, 2ndly, by softening and lubricating the new skin, so as to facilitate its growth, and the restoration of the part to its natural condition.

The local employment of glycerine has, of late years, been adopted in a still more important class of cases than those just mentioned; M. Demarquay, and some other French surgeons, having substituted glycerine for water and other dressings in the treatment of wounds, whether from accident or after the performance of surgical operations. This mode of treatment is as simple as could well be devised. A piece of lint is first thoroughly soaked in the glycerine,

and then placed in apposition to the surface of the wound; over this another piece of lint is placed, next above this a compress, and the whole is kept *in situ* by means of a bandage. The glycerinated dressing possesses the advantage over the ordinary methods employed that it seldom adheres to the surface of the wound, that it can be changed or renewed with the greatest facility, and that thereby may be avoided the frequently injurious dragging which destroys the newly-forming cicatrix, retards the reparatory process, and hurts and annoys the patient. The glycerinated dressing can also be applied more quickly than ordinary dressings with water or cerate, and, the wound being less exposed to the air, the risk of erysipelas or gangrene is proportionately diminished.

Glycerine is also very extensively used in the treatment of affections of the skin. In many of these, more particularly in such as are characterised by dryness and harshness of the cuticle, glycerine, of itself, effects a speedy improvement; while in others, again, it serves a valuable purpose in bringing other remedies into direct relation with the diseased structures.

In affections of the eye, glycerine, alone, or in combination, plays an important part in the local treatment; while in certain forms of deafness, arising from a deficiency of the waxy secretion in the outer meatus of the ear, it works often like a charm when dropped into the meatus, so as to lubricate that passage and the external surface of the membrana tympani, commonly known as the drum of the ear.

Glycerine, when rubbed upon the surface of the skin, effectually protects it from the results of exposure to the air. A small quantity applied to the skin will prevent it from becoming chapped or chilled in winter, or from being burnt and inflamed in the summer. The Russians, taking advantage of the peculiar properties of glycerine, are in the habit of employing it to protect themselves against the severity of their climate. This they do by spreading a layer of glycerine upon their faces and other

exposed parts before starting on their sledge-journeys; the skin is thus effectually guarded against the excessive cold, as the glycerine neither evaporates nor congeals.

Glycerine is used internally in some diseases; notably in consumption, as a substitute for cod-liver oil. Notwithstanding its undoubted nutrient property it is not equal to the latter in the treatment of phthisis, owing to the absence of certain chemical elements upon which the efficacy of cod-liver oil in a great measure depends.

At the same time, the value of glycerine, administered to consumptive patients, should not be lost sight of; occasionally, as it is much more easily tolerated by the stomach, it may be alternated with oil, or the two may be given together. I have known several cases in which the patients were unable to take cod-liver oil when given alone, but readily retained it when given in conjunction with glycerine.

As another instance of the value of glycerine given internally, I may here mention the employment of glycerine by diabetic patients, to render more palatable different articles of diet, ordinarily flavoured with sugar, which they, of course, are interdicted from taking. This may appear a matter of little moment, but it really is not so; the necessary omission of all saccharine substances from the diet of persons suffering from diabetes makes it important to endeavour to relieve them from the feeling of monotony and dislike for food engendered by the rigid exclusion of all articles containing sugar.

In the preparation of medicaments the rôle played by glycerine is wide and very important. For many reasons it is superior to water, alcohol, lard, and the other fluids and solids commonly employed as media or vehicles for different remedial agents. It possesses the power of dissolving a very large number of substances and of thus placing them in a condition favourable to absorption. It does not decompose them, and from its penetrating

qualities, it readily enters the structures to which it is applied. Besides possessing these advantages, it is free from various disadvantages to which other media are subject. The volatility, fluidity, and irritant action of alcoholic and ethereal preparations are opposed to their general use; and fatty substances are open to the objections that they possess only a limited power of penetration, that they do not dissolve many chemical compounds, that they stain and discolour the patient's skin and clothing, and that they soon become rancid. None of these objections exist as regards glycerine, and it is consequently largely employed in making ointments, liniments, lotions, etc.

By mixing powdered gum-arabic with glycerine, in the proportions of four of the latter to one of the former, Cap and Garot succeeded in making a compound which, when spread upon linen, forms excellent plasters, firmly adhesive, yet at the same time retaining their flexibility. Any of the numerous substances soluble in glycerine can be introduced into these plasters. Collodion may be much improved by adding a small proportion of glycerine to the common collodion, 2 to 100 parts; this addition is sufficient to impart considerable suppleness and elasticity to the collodion, and to prevent its cracking and drawing up the skin. Another useful purpose to which glycerine may be applied is to prevent the drying and hardening of poultices, a small quantity of glycerine, added to the paste of which they are composed, having the effect of keeping them moist for a long time. A mustard poultice, superior in its action to any prepared in the ordinary way, may be made by mixing together three drachms of glycerine, two drachms and a half of starch, and ten drops of essence of mustard. This may be spread upon a fold of linen, and, when applied, acts very quickly.

Hundreds of other pharmaceutical uses to which glycerine may be advantageously put might be enumerated, but I have written



enough to show its applicability to the improved preparation of numerous external medicaments. Moreover, in the case of some pharmaceutical preparations intended for internal use, glycerine has been found superior to water and other media, owing to its capability of continuing undecomposed for almost any length of time.

Its peculiar properties of remaining unaltered in constitution and of preventing the decomposition of substances placed in it, have led to a trial of glycerine as a means of preserving provisions. The chief drawbacks to its extensive adoption are, firstly, the expense of the glycerine as compared with some other processes, and, secondly, the very sweet flavour which it communicates to the meat. In great measure the latter fault may be obviated by carefully washing the meat with water previous to cooking, and it is probable that by the introduction of a system which will allow of the re-employment of the glycerine the expense may be reduced to a nominal cost. I have tasted meat which has been kept for several months in glycerine, and which was perfectly fresh at the expiration of that period.

The anti-putrescent qualities of glycerine have been taken advantage of in the preservation of anatomical and botanical specimens. These retain their natural appearance for a long time, and glycerine possesses the superiority over alcohol of not evaporating, and of not discolouring the preparations placed in it. At the Museum of the Faculty of Medicine, in Paris, glycerine has been adopted as a preservative fluid for flowers and fresh plants, and has been found to answer admirably the purpose for which it is used. The external condition of vegetable specimens is only slightly affected, as the green colouring matter (chlorophyll) is not dissolved, so that the green plants retain their natural hue; while the corollas of the flowers also present their usual appearance, with the exception of losing some of the brilliancy.

To the microscopist glycerine holds out numerous advantages, as it is one of the most

useful fluids for the preparation of elementary tissues for microscopical examination. It possesses a great power of penetration, and the absorption which occurs in each molecule often displays minute details of structure, which might otherwise escape observation. Its anti-putrescent property also enables the specimens to be kept for a long period.

In the manufacture of perfumery and cosmetics, the employment of glycerine has for some time been very considerable, and continues to increase. The ready manner and large extent in which nearly every chemical substance is soluble in glycerine, its power of preventing decomposition, and other properties to which I have already referred, render glycerine a most important adjunct to many cosmetic preparations.

The use of glycerine is also extensive in connection with many other branches of industry. As an example of this we may mention that silk and woollen dyers often employ glycerine instead of methylated spirit, as formerly, to dissolve out the aniline dyes, and to "slow" the bath. The exact mode in which this is done is kept secret—a tolerably good proof of itself that the use of glycerine is an improvement over other methods.

In addition to the uses mentioned, glycerine plays an important part in many manufactures.

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#### FOUR-INCH versus SIX-INCH HOUSE DRAINS.

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By G. M. LAWFORD, Assoc. M.Inst.C.E.

It is a matter of everyday occurrence to find a 6-in. pipe used for the drainage of a single house, and this size is usually made compulsory by sanitary authorities, whether metropolitan, urban, or rural.

As a house drain is frequently dry for several hours at a time, it is obvious that where pipes of this diameter are used there must be a considerable extent of surface upon which sediment

is deposited, and, as a natural consequence, during the periods of minimum flow this deposit will decompose and foul gases will be generated. If the house drain is properly disconnected from the main sewer and efficiently ventilated, a large proportion of these gases will undoubtedly be carried off and liberated in the atmosphere; but the tendency of the remainder will be to move in the direction of the house, by reason of the absorptive influence of the warmer air within.

My contention is, that the generation of gases in the house drain, apart from its being adverse to the principles of sanitation, is preventible, the remedy lying in the use of smaller pipes.

Taking as an example the case of an ordinary town house, with an average of 10 inhabitants, and allowing 30 gallons of waste or liquid matter to be discharged per head per day, the total volume would be 300 gallons per day, and of this amount at least one-half must be reckoned as being discharged in six hours, this giving 25 gallons per hour as the maximum flow to be provided for. To this amount must be added the rain-fall from the roof and the areas, which as a rule in the case of town houses, must be taken into the sewer. The superficial area to be dealt with under this heading varies from 1,000 to 10,000 square feet; taking 6,000 square feet, which is considerably in excess of the average, and allowing for  $1\frac{1}{4}$  inch of rain-fall per hour (thus providing for the heaviest thunderstorms) the total volume of rain-fall to be dealt with would be 3,900 gallons per hour. The maximum hourly discharge of sewage and rain-fall combined would therefore be 3,925 gallons, or 65.4 gallons per minute, and a 4-inch pipe will discharge this amount when running full at the very flat gradient of 1 in 207.36, the velocity produced being 2.02 feet per second, which is barely sufficient to make a drain self-cleansing.

As the conditions on which these figures are based are only likely to occur once or twice a

year, if at all (*i.e.*, during an exceptionally severe thunder-storm) it is evident that without special arrangements for flushing, even a 4-inch drain can scarcely be made absolutely self-cleansing, more particularly as the usual gradient is from 1 in 40 to 1 in 60, with a consequent increase of discharging capacity.

I therefore consider that ordinarily a 4-inch drain is ample for an average-sized house, and that a 6-inch drain is too large to be kept free from deposit, more particularly as the majority of the pipes discharging into it are three inches or less in diameter. Baths, lavatories, and sinks never have waste-pipes exceeding two inches internal diameter, and it is the exception to find more than one of these being discharged at one time. The question therefore naturally arises, "How can a 2-inch pipe possibly flush and cleanse a pipe nine times its own sectional area?"

The soil-pipe is the only pipe of larger size which ever discharges at full bore, and the amount discharged at one time—two or three gallons at the most—is insufficient to make a 4-inch horizontal drain run even half full for more than a few feet.

Automatic flushing is of the greatest assistance in keeping a drain free from deposit, and should be adopted in all cases where possible, and more particularly in cases where, from the depth of the main sewer, the inclination of the house drain exceeds 1 in 60.

A tank containing not less than thirty gallons is sufficient to cleanse a 4-inch drain by means of a 2-inch syphon and flushing pipe, and it should be placed at the extreme end or bend of the drain, at least six feet above the latter point.

I maintain that by using a 4-inch drain laid at a uniform inclination not exceeding 1 in 60, aided by automatic flushing, all refuse and other matters discharged into it will be removed in the shortest time, and with the minimum of deposit. To those who argue that a 4-inch drain would be choked by such ex-



traneous objects as a duster, a medicine-bottle, or a hair-brush, the saying, "A place for everything, and everything in its place," may be aptly quoted, as a house-drain cannot obviously be the place for a hair-brush, and the removal of such articles can be effectually provided for by making every length of drain accessible from inspection chambers.

Another argument in favour of the 4-inch pipe is the increased circulation of air in the drain, as by diminishing the sectional area of the passage the velocity of the air current is greatly accelerated, the volume of air which has to be set in motion in order to produce circulation being more than double (2·24 times) the volume in a 4-inch pipe.

Gases generated in a 4-inch drain would certainly be carried away more quickly than in a 6-inch drain, apart from the fact previously stated that the possibility of the creation of such gases is reduced to a minimum, while in a 6-inch drain their existence is an absolute certainty.

To summarise briefly the objection to a 6-inch drain is the fact that deposits must be formed from which noxious gases are generated, with the probability of contaminating the air in the house, while the advantages of a 6-inch drain are:—

1. Deposit is reduced to a minimum;
2. Its size is ample for the discharge of the greatest amount of waste and rain water that can possibly pass into it;
3. When combined with automatic flushing at regular intervals, absolute cleansing is obtained; and
4. The increased strength of the air currents, and the resulting more effectual and rapid purification of the drain.

I would, therefore, in conclusion, urge on all sanitary authorities the advisability of reducing the size of house drains, as laid down in existing by-laws and regulations; for while they all endeavour to exclude sewer gas from house drains by means of disconnection and

ventilation, the question of its generation in the drains themselves has apparently been hitherto overlooked.

## HANDWRITING IN RELATION TO HYGIENE.

Reports by Professor A. REUSS and Professor  
A. LORENZ.

AN article on this subject, which appeared in the March issue of *HYGIENE*, with a page illustration showing the relative positions of the body in vertical and in slanting writing, attracted considerable attention. We now publish, in an abbreviated form, reports drawn up at the instance of the Austrian Supreme Council of Health, by two eminent specialists, Professor A. Reuss, in Ophthalmology, and Professor A. Lorenz, in Orthopædics.

These reports were printed in *Das Österreichische Sanitätswesen* (The Austrian Hygiene) which is the official organ of the Supreme Council of Health.

### A.—IN RESPECT OF OPHTHALMOLOGY.

For years the "school bench" question occupied medical men and teachers. Short-sightedness and curvatures of the spinal column continually increased in number and degree, and called for preventive measures. The question of school benches was considered as solved by a correct proportioning to the size of the body, by the introduction of the minimum distance, and the application of so-called back-rests. The question proved unsolved. Children sat upon the new benches, approved by the faculty, just as badly as upon the old. Certain of the specialists now sought still further to improve the bench. They wished to counteract the injurious bending forward of the body during writing by a high sloping back, and by a compulsory (though to the scholar unconscious) introduction of the reclining position in sitting. Unfortunately there was up to this time no practicable mechanism invented for the construction of a suitable adjustable desk for a

sufficiently reclining position. This question also delayed the solution, and the newest benches, which are at present constructed upon the principles laid down in the School-bench Inquiry of the Vienna Common Council, are merely makeshifts towards a solution of the question by mechanicians.

But even after the solution of this question, it will be doubtful whether the benches, correctly built in theory, will in practice commend themselves.

To the oculist and to the surgeon it was always evident that the position of the head in writing exercises a powerful influence on the whole attitude of the body, and that an abnormality in the attitude of the head, which is at first apparently unimportant, soon brings in its train a very erroneous position of the whole body.

It was found that in reading we always turn the head so that the base-line of the eyes (that is, the line connecting the axes of the two eyes) if prolonged to meet the surface of the page, corresponds to the direction of the lines of print. Further, in writing it will usually be seen that the ground-strokes of the letters stand perpendicular or approximately perpendicular to the prolongation of the base-line of the eyes. The direction of the lines of writing, and the angle which the ground-strokes make with the line, influence considerably, therefore, the attitude of the head and of the whole body.

But even here there soon appears a difference between theory and practice. People thought that if only the ground-strokes came to be perpendicular to the edge of the table, the base-line of the eyes must needs remain parallel to this edge, and so the whole body exhibit an upright position.

But this was not invariably so. In the so-called oblique middle position of the copy-book, the above postulate was fulfilled, and yet the children sat awry. It became manifest that the direction of the lines exercised a great influence on the attitude of the body, and that the school

children placed the base-line of their eyes parallel to the edge of the table, when the lines also ran parallel to it, provided that a turning of the head was not necessitated by the obliquity of the letters, that is, provided the ground-strokes stand upright on the lines, or in other words, that vertical writing is used.

To Head-master Dr. Bayr we owe the service of having first proved by experiment on a large scale, the correctness of the theoretical considerations we have just briefly stated. They triumphantly furnished the proof. The position of the scholars in vertical writing is a model one: the head is but slightly bent, and remains—which is, to the oculist, the most important point—at a suitable distance from the desk: and therewith the whole body also preserves a correct attitude.

It is strongly recommended that the Imperial and Royal Supreme Council of Health should support to the utmost the endeavours towards a general adoption of vertical writing.

#### B.—IN RESPECT TO ORTHOPÆDICS.

In the report now presented, the theoretical grounds which were alleged on behalf of the direct middle position of the copy-book, and against the oblique middle position, will not be stated; for this question has already repeatedly been exhaustively stated. It must, however, be said that the results of the latest researches in this field (the eminent work of the oculist, Dr. Schubert, of Nurnberg, is here specially referred to) speak, without exception, in favour of vertical writing.

The problem before the Commission consisted simply in this; to see in use the system of vertical writing introduced methodically by Herr Dr. Bayr into the institution under his charge, and especially to observe its influence on the attitude of the children while writing.

In this connection it must be stated that the members of the Commission have unanimously carried away the best impression of the correctness of attitude of the children who write the upright hand. By the arrangement made—



the children on the benches on one side of the schoolroom writing the customary oblique hand, those on the benches opposite, on the contrary, the upright hand—the extraordinarily favourable impression which the attitude of the vertical writers made was rendered much more impressive and important.

The aforesaid correct attitude of body of those children who used vertical writing showed itself, without any influence whatever on the part of the superintending teacher, so characteristic and so constant, that in a second class, where children who wrote upright and those who wrote obliquely were grouped quite irregularly, the members of the Commission were able, even from a distance—and more easily upon a close view, especially from behind—to distinguish the two groups one from another.

Further, it was evident that also for rapidity of writing the children in some degree accustomed to vertical writing were in no way behind those who wrote obliquely.

It was remarkable that the vertical writers showed a permanently upright position of the head. In the oblique writers, even if the position of the head was good at the beginning of the work, gradually in the course of the writing lesson there appeared a marked tendency to bend the head to the left. The position of the head is affected in a recognisable degree by the direction of the lines of writing; and since these run parallel to the edge of the desk in vertical writing, the necessity of turning the head to the left is done away with for the child who writes upright; whereas the oblique writer is, to some extent, compelled to turn his head, owing to the lines ascending towards the right.

A correct position of the head must be recognised as the primary essential of a good position in writing. Each side-turning of the head is necessarily followed, owing to the changing of its weight, by lateral movements of the vertebral column, whose frequent return, with longer duration each time, is without

doubt recognisable as one of the most frequent causes of crooked growth.

Quite apart from all other advantages, and even in spite of numerous small disadvantages of vertical writing—for example, the necessity of moving the whole arm laterally as one progresses along the line, and especially the necessary shortness of the lines, &c.—the absolute superiority of this method of writing over other methods must be recognised, for the children who use it are not in the least compelled to any lateral bending of the head, owing to the kind of manipulation used in their writing exercises!

The practical employment of vertical writing corroborates the theoretical inference that it does not, by the method and manner of practising it, conceal within itself the necessity and compulsion to an oblique position of sitting, and consequently to a crooked growth.

Given rightly-proportioned seats — and especially back-rests which are rightly constructed and available also in the writing position, by means of which the fatigue which necessarily and unavoidably follows each position of sitting is most practically held in check—vertical writing is very much to be preferred, from the orthopædic point of view, to oblique writing, and has been recommended for a long time by many orthopædic surgeons in private practice, with the best results, for rendering the writing position a healthy one.

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## THE WATER SUPPLY OF COUNTRY PLACES.

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No more difficult problem can be faced than to supply pure drinking water in thinly-peopled and extremely poor districts; the expense is, of course, *the* difficulty. Townspeople are hardly capable of understanding the obstacles to rural sanitary reform. A country landscape is, especially in summer, so green, fertile and beautiful that, deceived by an appearance of boundless resources, and misled by the high

price of land in towns, the townsman sees no difficulty. Why cannot the squire be compelled to disburse £20,000? Why cannot the farmers be rated for the purpose? Why not? Because an acre of rich pasture is hardly worth £40 and barely lets for £1; because the squire's whole fortune may not be more than double or treble what his yearly rental is commonly assumed to reach; because the farmer, renting a couple of hundred acres, earns a smaller income than a third-rate shopkeeper. A wealthy tradesman, or prosperous manufacturer or merchant, is as well off as most county gentlemen, and could buy up fifty farmers. The fee simple of some estates would hardly rebuild and repair the cottages on them.

Rural sanitary improvements are, therefore, necessarily slow and uncertain, and cause their promoters perplexity. Of late, matters have been rapidly getting worse, and even great rural proprietors have been weighed down by debt and poverty. I am too sensible of the difficulties to propose ways out of them, although extending over say twenty years, every necessary reform could be carried out, and the expense under such circumstances need not be insuperable. Nay, I am convinced that with thrift and prudence, everything which sanitarians consider indispensable could be managed in from twenty to thirty years; and good water, commodious houses, and the prompt removal of dry and liquid refuse, would be the rule, not, as now, the exception.

In large towns there are two ways of getting pure drinking water: from artesian wells, or by means of water-works and reservoirs, the latter finding their supplies in unpolluted sources; and some of the engineering enterprises of late years have been stupendous—for instance, those so brilliantly carried out by Glasgow and Manchester. In small towns and large villages—places with from one to three thousand inhabitants closely packed together—water is generally sufficiently abundant, and for domestic and culinary purposes unobjectionable,

but it is often unfit for drinking, and might occasion dangerous epidemics. What is to be done? Sanitary writers seldom seem to understand that the amount of pure drinking water required per head is extremely small. Estimates are framed showing that one hundred and sixty gallons a day are needed for a household, and by a strange confusion it is assumed that the whole of this must be pure. In many cottages not a quart a day of drinking water is consumed or needed, and a gallon per house would be ample. It is not necessary to give every house of the poorer class a pump, and, on the average, one deep well for ten or twelve would suffice. When cottages are close together, one tap or pump might supply thirty or forty houses, and the taps or pumps might be a hundred yards apart. Where it could be managed it would be better to provide every house with its own special supply, and the whole of the water used and drunk might then be of the best quality. How much rain water, that no one would dream of drinking, is used in the better class of houses, and does excellently for washing. Pure drinking water is not a commodity in much request among the poor, who mostly prefer beer. Could one credit them with extensive reading one might fancy they had heard of the outbreak of typhoid fever in March, 1869, at Bramham College, Yorkshire, where those persons who drank beer escaped, while those who kept to water suffered. It is noteworthy that though the water used for cooking in that establishment was drawn from a well communicating with a polluted soft water tank, it did no injury, the boiling to which it was subjected destroying disease germs. Other instances are recorded, and are of service to the sanitarian as showing that the poisonous properties of polluted water are removed by long-continued boiling.

Assuming that local authorities ought to supply or to insist on the supply of pure drinking water in sufficient amount to every house in the district, and that, although a large



outlay might in many cases be necessary, the diminished sickness and pauperism would, in the long run, repay it many times over, the question comes: How is pure water to be got? In some places, depending on local conditions, the neighbouring watercourses would furnish inexhaustible supplies to every house, and stringent measures should be adopted to prevent pollution. Rivers are generally too much polluted to be useful, and small towns, villages, and detached houses have to depend on pumps, which answer fairly. Open wells ought everywhere to be covered in or filled up, and the latter is generally the wiser course. Few open wells are deep enough, or have been sunk in such places that, carefully protected from surface impurities, they should be used for drinking, although, when only needed for domestic purposes, well water is unobjectionable.

A common plan in hamlets for getting water is to send children with buckets and small cans to the well. These cans are fastened to a bit of string, and are then lowered into the odorous fluid, which may be only three or four feet from the surface. An examination of nearly all open wells long in use shows that the water is dangerously polluted, and that the situation of the shaft, its shallowness, and its nearness to houses and ashpits, make improvement impossible. The only remedy is to fill them up, and to sink fresh shafts to a greater depth and farther away from the houses. Still better, however, would be pumps, sunk at a great distance from the house, and deep enough to go through the sewage-saturated soil. I see no objection to this plan, and, indeed, no other is practicable in country villages, where reservoirs, waterworks, and costly systems of pipes for conveying water are entirely out of the question, and would, in some cases were they attempted, cost almost double the rents paid. To insure that the water should be pure and abundant, the depth and number of pumps would have to vary with the locality. In small villages a couple of public pumps would be enough; nay, in some

cases, one deep pump, conveniently and centrally situated, would do.

Experience shows that a single good well or pump sufficiently deep will, in the open country, supply large buildings, such as asylums, gaols, and orphanages, with abundance of wholesome and pure water, and many a village is less populous than one of these great institutions. Pumps cannot in a village, any more than in a town, be indefinitely increased in number; but many towns are so small as not to tax the pumps immoderately, while in places of six or ten thousand inhabitants waterworks would be cheaper and more convenient than anything else.

The result is that, could we induce the poor in villages, where an abundant supply of pure water is difficult, to practice common prudence and economy, it would only be necessary to sink four or five deep wells to supply a thousand people or more with drinking water. Polluted wells should be filled in to prevent their contents being drunk, and measures should be devised to prevent the pollution of running streams, the water from which, and from shallow wells not dangerously foul, might be used for culinary and domestic purposes. But, who that knows the habits and small intelligence of the labouring classes—shall I add all classes?—would expect this plan to work? The handiest open ditch or pool, the shallowest pump or well, polluted or unpolluted, provided that it was close at hand, would supply all the water for both domestic and drinking purposes. As things are, there is some reason in the proposal that no shallow well should be left, and no cottager be permitted to go to any polluted or suspected stream for water. I am not sure that any scheme for supplying villages with pure water would be of real value, unless, besides providing sufficient drinking water, it completely removed the temptations to drink the polluted water which might be slightly more accessible.

For washing and domestic purposes the supply of good, clean, soft water would not be difficult

were the roofs of cottages properly and evenly tiled, but at what a sacrifice of the picturesque would this change be made! Then large tubs or cisterns might receive and store rain water falling on the roof. At present, though matters are mending, comparatively few old cottages are tiled or slated; and many that are have roofs remarkable for irregularity, and could not catch much rain. Were new villages to be built on elevated and suitable sites, at a distance from existing houses, on soil free from pollution, good wide streets might be cut, fringed with well-built cottages, properly tiled, drained, and ventilated. The rain-water falling on the houses could be stored in cisterns or tanks for domestic purposes, and deep pumps at the corner of each street might be sunk to supply drinking water. One cannot help wishing that some benevolent millionaire, instead of giving large subscriptions to twenty different hospitals, and at his death bequeathing £100,000 to wealthy and often misused charities, would build a model town on the plan of Saltaire. In a few years the statistics we should get from eight or ten little towns, containing five or six hundred good new houses apiece, would be invaluable to the country, and would be landmarks and guides to sanitary authorities. Till then, sanitary and social reforms must be slow and difficult, and in the present depressed state of agriculture, and with the dwindling population of most rural districts, there is little chance of country villages being constructed and improved on scientific principles.

AN OLD OXONIAN.

### PRESERVED FARINACEOUS FOODS.

By THOMAS T. P. BRUCE WARREN, Analytical Chemist.

A NUMBER of years ago an article on Liebig's Food for Infants appeared in the *Popular Science Review*. A well-known pharmaceutical chemist at once took the matter in hand, as he was convinced that this preparation was both

useful and important. But for this gentleman's practical tact and perseverance, it would, in all probability, never have been raised to a permanent reality.

Professor Liebig himself was so impressed with this fact that he wrote to this gentleman, thanking him for what he had done in giving prominence to this preparation, and expressing his strong dissatisfaction at imitations which were issued as "Liebig's." I have seen his letter, and can vouch for the entire truthfulness of what I write. It was never used for trade purposes, a fact which I had often thought reflected a great deal of credit on the chemist referred to.

Liebig's Food consisted of wheat-flour, ground malt, and a small quantity of carbonate of soda. It is well known that many an infant cannot be brought up on its own mother's milk, and consequently must have to depend on something artificial, adapted to the tender organs of digestion, to make up for the deficiency in the natural sustenance.

Strong, starchy food is a veritable *reductio ad absurdum* for such cases. When flour is mixed with water and boiled, we obtain a paste, having more or less the consistency of pudding, according to the quantity of flour used. It would be impossible to imagine any diet more indigestible, or likely to produce worse results.

A portion of Liebig's preparation was mixed with cold water in the usual way, a thick paste being formed, as might have been expected; but, on boiling, the diastase of the malt, acting on the starch granules of the flour, converted them into saccharine principles, which were more easily assimilated. This part of the operation produced a marked change in the consistency of the compound; it suddenly became quite fluid and sweet, the addition of sugar was unnecessary, and the carbonate of soda served to arrest any tendency to acidity which might arise in the infantile stomach. The previous cooking, in reality, performed a great deal of the chemical functions of the stomach as re-



gards conversion into principles more readily digested and appropriated as flesh formers, heat producers, and nitrogenous matters.

The chemical constitution and preparation of this food furnish a remarkable illustration of what science may be expected to achieve when worked out by a master-mind, such as Liebig pre-eminently possessed.

I propose to consider some of the difficulties which were encountered in the early stages of its manufacture, and which show that a preparation possessing such extraordinary latent activity requires many special precautions to be taken in every department.

Among the earliest complaints made concerning it was its liability to produce diarrhoea. This I attributed to the irritation of the coats of the intestinal canal, produced by the husks of the malt. The malt was afterwards simply crushed, taking care in sifting not to allow any portion of the husks to pass through. A better and more refined precaution would be to dress this malt powder through silk or other material, having, say, 120 meshes to the linear inch.

The slightest amount of moisture in the finished preparation, or insecure fastening of the tin, led to a most unpleasant decomposition. The contents of the tin gradually became pasty, and presented a most disagreeable appearance. This was got over by having everything perfectly dry and quite warm when packing; in this way the previous defect was entirely removed. A piece of tinfoil was pasted around the tin, so as to secure the lid, but after a time very minute insects were detected in the powder. This led to the further precaution of securing the junction between the tin and cover with a strip of tinfoil moistened with shellac varnish.

To test the value of these precautions, a few tins were placed in a damp place, heated to 120 degrees Fahrenheit, for some months, and in the midst of active fermentation. A portion of the powder was then placed under a powerful microscope, and carefully examined for living organisms, and the results were eminently satis-

factory. But this important fact was established: that the most rigid care was necessary in compounding and ultimately packing this food.

It may be necessary to inquire how far these or corresponding precautions are generally taken in packing farinaceous and similar articles of food, so as to guard against all possible chances of intrusion of low-typed organisms.

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## BRITISH HEALTH RESORTS.\*

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### No. 21.—The New Forest.

By DR. A. J. H. CRESPI, of Wimborne, formerly  
Editor of the *Sanitary Review*.

LAND, as countries become densely peopled, acquires a high value, and the powerful seize upon and appropriate every foot to which they can establish any claim. This state of things is natural, and has great economic advantages, so that it would be absurd to object to what is for the general weal. At the same time, although pleasant to be the undisputed lord of a hundred thousand acres of fertile and wooded land, and to know that neither fire nor shipwreck, robbers nor swindlers, can affect the value of landed property, it is not so delightful for the tens of thousands without a foot of

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\* The object of this series is to direct attention to the merits of different British localities too often overlooked and neglected by persons who are put to much expense, trouble, and loss of time, in visiting Continental places, instead of availing themselves of facilities open to them in their own country. No. 1, Hastings and St. Leonards; No. 2, Cornwall; No. 3, Droitwich and its Brine Baths; No. 4, Swanage; No. 5, Isle of Man; No. 6, Lowestoft; No. 7, Llandrindod Wells; No. 8, Rostrevor (Ireland); No. 9, Cromer and Yarmouth (Norfolk), and Rye and Camber (Sussex); No. 10, Brighton; No. 11, The Undercliffe, (Isle of Wight); No. 12, Bournemouth, by Rev. R. A. Chudleigh; No. 13, The Climate and Surroundings of Bournemouth; No. 14, Yarmouth; No. 15, Dinsdale-on-Tees; No. 16, Ilfracombe; No. 17, Lyme Regis; No. 18, Leamington; No. 19, Malvern; No. 20, Buxton and the Peak; No. 21, The New Forest. Any single number can be had post free by remitting seven stamps to Beaumont and Co., 39, Southampton Street, Strand, London.

ground to call their own, and who cannot walk across a field, or ramble through a wood, unless at the risk of being prosecuted for trespassing. The condition of things in England is as follows:—A few thousand landowners hold sway over thousands of broad acres apiece, while millions of humbler folk are excluded from participation in the enjoyment of owning land, and are seldom able to see anything of the beauties of the country. The possession of land in England gives many privileges, social and political. Land has heretofore been a safe investment, and until ten years ago was everywhere gradually increasing in value. Year by year the advantages of owning it became greater, and I cannot well see how this could be otherwise, and no Act of Parliament could materially alter the present state of things. Land, in the circumstances in which we live, is a safe and coveted investment; its value must on the whole increase, and the difficulty of buying it get greater. Surely we cannot suppose that the recent agricultural depression will last for ever, and that the death-knell of landed property has sounded. Agriculture has been as depressed, rents have been as low, and the farming outlook has been as bad, twice before in the lifetime of living men. The millions of England cannot hope, like the frugal peasantry of France and Italy, to own and live upon their little plots of land, to till them with their own hands, and to be contented and thrifty peasant farmers. Our climate is against us, while our manufacturing and commercial industries present opportunities for the acquisition of wealth which *la petite culture* could never do. So far nearly all writers and speakers on the subject of land are agreed; but the matter does not end here. Though few townspeople can own land, though every foot is increasing in value, and is being jealously tied up from the masses and becoming the possession of a small class, large open tracts of land are invaluable breathing-places, and of vital importance to the continuance in health and comfort

of the toiling and suffering millions. Attempts have been made to supply this great boon to the crowded centres of population by providing them with People's Parks—so at least they are called, though often more like bleak moorland than verdant and health-giving parks. As far as they go, however, they are a blessing to thousands, who would otherwise rarely walk anywhere except along dusty roads and dingy town streets. But in addition to small parks, close to or in towns, we require larger tracts of unappropriated hill and dale, plain and woodland, where health and fresh air may be within the reach of every one who can leave his town home for a few weeks. Such open spaces were, till recently, numerous, and very easy of access. One by one the neighbouring landowners have established claims to the moors and forests. One by one open spaces have been enclosed and been taken from the nation, and have become the property of private possessors. What is done is past and cannot be undone; but against fresh encroachments we must exert ourselves promptly and energetically. We must preserve the few open spaces remaining.

It is with a thankful heart that the present writer has heard that the insidious attempt to close part of the New Forest against the nation has been defeated, and that the War Office will not be permitted—at any rate, without a hard fight—to establish any rifle ranges in the finest open space in the south of England.

Everyone has heard of the New Forest and has read how the relentless Conqueror depopulated the southern districts of Hampshire to provide himself with a great forest, where he and his sons could hunt; but a glance at the land shows that it never could have supported a large population, and the tale has lost nothing in the telling. Everyone has heard how the Conqueror's fierce son, the Red King, on the eve of an expedition to France, rode down from Winchester, eighteen or nineteen miles, to Canterton Glen, a spot thenceforth memorable in history, where, struck



by an arrow in the breast, he died. Perhaps we have wondered how his death came about; whether his companion, Sir Walter Tyrrel, shot him purposely, as Walter Savage Landor has fancifully tried to prove; or whether the French Baron accidentally killed him; or whether, as dark tradition whispers, some Saxon churl, dispossessed of his hut or lands, chancing to pass by, shot the Red King, and brought his life of infamy to an end. Everyone knows that the New Forest was fatal to three members of the Conqueror's family. There, in 1081, Richard, the second son of William of Normandy, met his death. There died, accidentally shot by an arrow, in May, 1100, another Richard, the son of Duke Robert, and there, on the second of August of the same year, the Red King died, to the great grief of very few.

The New Forest is that portion of the county of Hants bounded on the east by Southampton Water, and by the Avon on the west, having the sea to the south, and a line from North Charford on the west to Wade and Owerbridge on the east. In Domesday Book the New Forest was stated to contain seventeen tenants in chief, and seventeen under tenants, the latter corresponding to modern copyholders; eighty-seven *bordani*, or cottagers, people holding a *bord* for which they gave rent or service to the lord; sixty-six *villaini*, and two hundred and thirty-two *serfs*. The total area of the Forest is 91,000 acres, of which private owners hold 26,000 acres, the Crown is absolute lord of 2,000, and to the remaining 63,000 the Crown has, in common with 850 proprietors, certain claims. About 5,000 acres are covered with ancient and well-grown timber; 10,000 with timber nearly two centuries old, and perhaps as much more with young plantations.

In 1670, only 5,000 acres belonging to private individuals had been enclosed, while in 1783 they had appropriated or enclosed 24,797, besides 901 acres of encroachments, and 625 acres of Crown copyhold. As for the timber, in 1608

there were known to be 123,927 timber trees fit for cutting down, and these, with dotard or decayed trees, gave a total of 315,477 loads of timber. This had been reduced by the speculation of the keepers, and the neglect of the verderers, to 20,830 loads in 1783. Deer were plentiful in the forest through many centuries, but though large sums were granted by the Crown for hay, they were in like manner greatly neglected, the keepers and the poachers thinning their numbers mercilessly; while as many as 300 died in one Forest walk from starvation in the severe winter of 1787. They were finally cleared off in 1851, the Crown taking then, in lieu of feeding the deer, the right of planting 10,000 additional acres.

There are several ways of seeing the Forest to advantage; the best is to take rooms at Brockenhurst, or at Lyndhurst, in the very heart of the Forest. From both places an active walker could penetrate into nearly every corner of the whole. Or a visitor could stay at Romsey, ten miles from Lyndhurst, and fourteen from Brockenhurst. This I have done twice, and in the bright, sunny and dry weather of August or September, long excursions could be made. In all these places there is no lack of accommodation, while Romsey is only sixteen miles from Salisbury, ten from Winchester, and ten from the famous Church of St. Cross, and, moreover, has a grand and perfect Norman Abbey of noble proportions. Lyndhurst is the capital of the Forest, and in its superb modern church, completed twenty-five years ago, there is a very remarkable fresco by Sir F. Leighton. Ringwood, at whose Grammar School Stillingfleet was educated, is eleven miles from Rufus's stone, but close to Ellingham, the grave of Alicia Lisle: and though more distant, it possesses some advantages, as it is easy to get from it to Bournemouth and to Christchurch Priory Church, and not difficult to get to and from Swanage, Dorchester with its ancient camp and Roman Forum, and Weymouth. Wimborne, too, though still further off, is not inconvenient,

and besides its fine and unique Minster and Chain Library, there are in its vicinity some very perfect camps; the most remarkable of these are Badbury Rings, and the Castle Hill at Cranbourne. Fordingbridge, again, is not bad, while even Lymington brings some parts of the Forest close.

The visitor must, however, depend on outdoor life and long excursions for his chief pleasure; the Forest towns are not in themselves sufficiently large to satisfy the lover of town life. In bad weather, rare, fortunately, from the beginning of May till the end of September, the district is extremely dreary, and the townsman would, I fear, utter many complaints.

The Boldrewood oaks are handsome, and of great size, so are many of the grand beeches near Rufus's Stone. The tree from which the arrow is said to have glanced that killed the Red King is long since dead, but its site is marked by a stone, enclosed in a huge triangular case bearing on its three sides the following inscription:—

“Here stood the Oak Tree on which an Arrow, shot by Sir Walter Tyrell, glanced and struck King William II., surnamed Rufus, on the breast, of which he instantly died, on the 2nd day of August, 1100. King William II., surnamed Rufus, being slain as before related, was laid in a cart belonging to one Purkiss, and drawn from hence to Winchester, and buried in the Cathedral Church of that City.”

“ANNO, 1745.

“That where an Event so memorable had happened might not be hereafter unknown, this stone is set up by John, Lord Delawar, who has seen the Tree growing in this place.”

Brockenhurst Church, distinctly mentioned in Domesday Book, is interesting, as the following extract from the work on the Forest, published in 1862, by Mr. John R. Wise, will show; at the same time there is nothing remarkable in Brockenhurst and its Church:—“The approach to the Church remains in all its beauty. For a

piece of quiet English scenery nothing can exceed this. A deep lane, its banks a garden of ferns, its hedges matted with honeysuckle, and woven together with long bryony, runs winding along a side space of green, to the lytch gate, guarded by an enormous oak (in circumference twenty-two feet eight inches), its limbs now fast decaying, its rough bark grey with the perpetual snow of lichens, and here and there burnished with soft streaks of russet-coloured moss, whilst behind it, in the churchyard, spreads the gloom of a yew, which from the Conqueror's day to this hour has darkened the graves of generations.”

The approach to the district from the Isle of Wight, and even from Bournemouth, can be conveniently made from Lymington, a quaint and fairly handsome little watering-place, though not specially remarkable for size or beauty or for its antiquities, but prettily situated and convenient, and at one time of much greater relative importance than at present. It is well, however, to be on one's guard against local traditions, and not readily to accept exaggerated narratives of departed grandeur:—“From the earliest times it evidently possessed the salt works, which, so late as the beginning of the present century, made the salt trade of Lymington second only to that of Liverpool, paying, as it did, a duty of £50,000 yearly upon the produce of its Salterns. The rock-salt of the north however, has driven sea-made salt out of the market, but so long ago as 1147, Richard de Redvers, a descendant from one of the noble families of Normandy, confirmed to the Church and brethren of St. Mary, at Quarr, in the Isle of Wight, the tithe which his father Baldwin had granted to them of the Lymington Salterns. In the reign of Edward III., when it sounds quaint to modern ears to be told Lymington contributed nearly double the number of ships and men sent by Portsmouth to that Monarch's fleet for the invasion of France, the Borough was summoned to return representatives to Parliament, but none were returned



till the 27th of Elizabeth, and it is somewhat remarkable that, from 1574 to 1834, the Burrard family held forty-six mayoralties, and represented the Borough in thirty Parliaments. They appear, in fact, to have been the Sultans of Lymington. It may interest readers to know that the modern proposal to pay Members of Parliament is simply a revival of an old custom. In earlier times, the officials of Boroughs, invited to send representatives to Westminster, frequently made a return that no one could be found willing to undertake the duties. The archives of Southampton show that Thomas Reynolds, in 1st Henry VII., received for his 'Parliament wages,' from January 23rd to March 8th, £7 13s. 4d., and at Christchurch, Sir Peter Mew, about the beginning of the eighteenth century, gave a bond, the condition of which was that he should not demand any pecuniary reward of the burgesses, or put the Borough to any expense on account of his service in Parliament. In 1677, to prevent animosities and other inconveniences, it was ordered by the Mayor and Burgesses of Lymington that for the future the election of Mayor, as well as of Members of Parliament for the Borough, should be by means of different coloured 'bullets,' to be placed by each Burgess in a box for that purpose, but this order does not appear to have been acted upon, and was rescinded shortly afterwards."

Through all the vicissitudes of eight centuries the ancient Saxon forest, the bounds of which were extended by the pitiless Norman, has been, in its way, one of the most beautiful parts of England. One landowner after another has seized upon broad belts of woodland, and large tracts of the forest have, under one pretext or another, been cleared and cultivated. Small towns and villages have sprung up in the forest, and some of the best kept and straightest roads in the kingdom run through that part of the county. Yet, after all, for sylvan beauty, for calm repose, for solitude, for accessibility, no other tract of equal extent is so remarkable.

Change there has been, but less than one would expect, and portions of the forest are what they were four or five centuries ago. In the New Forest the England of the Middle Age still holds its own.

The New Forest is locally said to be singularly rich in animal and vegetable life; but such claims are commonly made everywhere, and it is doubtful if they have much to rest upon as far as the New Forest is concerned. There are seventeen kinds of bronzed and green ferns, and seventy-two species of birds are resident in the forest bounds, while at least 230 of the 354 British species have been found in it. The insect life of the district is rich and varied, and in places the vegetation is luxuriant, while in other districts little except gorse and heather and poor grass grow. Taking it as a whole, the forest is not a fertile tract, though there are in the river-bottoms patches of rich land, which, partly from natural advantages, and partly from human care, have an air of fertility and beauty, standing in marked contrast to other parts.

How can I describe this lovely district? Persons, unaware that forests are not necessarily covered in all their extent with tangled old trees, fancy that, as soon as one enters the New Forest, there are on all sides vast tracts of woodland, and nothing but woodland. Never was there a greater mistake. Thousands of acres are covered with fine timber, and still larger tracts with newly-planted trees, and there are also very extensive heaths—in short, the forest consists of islands of verdure in a vast sea of barren, sandy heaths. The charm of the New Forest is, next to its extent, due to its variety. The heather is so thick, tangled, and tall, that during the late summer, when one mass of flowers, the forest is more attractive than the most carefully-kept garden, and I know nothing equal to it for wild, indescribable loveliness. The dry, indeed arid, soil of much of the district seems, in conjunction with the bright sunshine, to suit garden

flowers particularly well; and the abundance and variety of the latter are difficult to surpass elsewhere in England. So with the older woods: it is their beauty and extent that delight. The timber may not always be as large as one might wish, though hundreds of acres are densely wooded, and bear trees satisfying the connoisseur in timber. So with the younger plantations: their extent makes them remarkable. Persons who have often strolled through large woods and plantations, and are alive to the beauties of woodland scenery, feel how little they know of the charm of a great forest until they wander for hours in the New Forest. Nothing like the forest exists in any other part of England, and nothing like it could now be called into existence. It would take two or three centuries to produce such a forest. The mildness of the Hampshire climate has probably something to do with the luxuriance of the heather and gorse, and with the beauty of the scenery, equal to anything in the south of England, though falling far short of the romantic glens of Derbyshire and the rich verdure of Brecon and Hereford.

One of the most charming excursions is from Brockenhurst to the majestic ruins of Beaulieu Abbey. For nearly three miles the road winds through the trees, then passes for a couple more over Beaulieu Heath, and then gradually descends for a mile into the village; and, passing through the latter, we see on the left the handsome house in which Lord Montagu resides, and a little to the right, over the river Exe, stands the parish church, a vast building 150 feet long, once the refectory of the ancient abbey. The church is beautifully and reverently kept, and is remarkable for its superb pulpit, and for a covered arcaded passage leading to it. Near the church extend, for a vast distance, the remains of one of the noblest abbeys in the land, and most exquisitely situated. The abbey church was only seven feet shorter than Winchester Cathedral. Well was the spot named Beaulieu.

An uneasy feeling has taken possession of the public mind that the forest is in danger of being inclosed or felled. Attempts have been made to establish absolute claims to parts of it; and though there is little immediate danger of destructive change, no one knows what form these claims, inquiries, and investigations may assume. The best guarantee for the preservation of the forest is, that so large a proportion of the area known as the New Forest is covered with very young timber, that it would not be worth while to extirpate these plantations, and nothing of the kind is likely to be done for years. The older timber might be cut down, and the beauty of the scenery destroyed for a century or more—assuming that the removal of the finer timber would not be a step towards the cultivation of the land on which it grew. Fears for the New Forest may have been unnecessarily aroused, and there may be little prospect of destructive change, but while there is time to assert the claim of the nation to what remains of the forest, the opportunity must not be allowed to slip. No one could otherwise tell when the fairest woods in the South of England, still open to the public, might be closed against visitors and converted into private property, and no one can tell when the most charming woodland scenery, the most lovely heaths the eye could desire to rest upon, may be spoilt by the hand of man and so-called improvements.

Mr. Auberon Herbert has nobly fought the battle in the defence of the New Forest. His reputation, eloquence, and learning have stopped for a time the inroads of the destroyer.

Timber of comparatively small size is constantly being cut, both on the Crown lands and on the estates of the local magnates, and as long as this thinning out is not carried to too great lengths, no fault need be found; indeed it is a positive advantage at times to keep trees from being too thick. But in wandering through the New Forest, it has grieved me to see hundreds of trees lying in all directions. The excuse



would be that it is necessary to thin the timber. All I know is that, with the exception of the younger plantations, large tracts of woodland are so scantily covered with trees that on hot days there is hardly any shade. It is so easy to cut down a few thousand young trees and thin a wood, but it takes twenty years before the remaining trees have grown sufficiently to fill the large spaces made in all directions. So little old timber remains in this country that we must regard with suspicion attempts to remove fine young trees that would some day take the place of the forest monsters whose growth had required centuries.

If what I have said of the importance of preserving the New Forest in its present state, on account of its fascinating scenery, historical associations, and advantages as a health resort does not seem conclusive to zealous advocates of economy, who fancy that every foot of waste land should be utilised to grow food for our vast and hourly increasing population, let me remind them of a few ominous facts. Were the whole of the New Forest cleared, were the whole 63,000 acres remaining used for agriculture, the produce would not maintain the inhabitants of one such comparatively small town as Bath or Cheltenham. At present, half our food comes from abroad, and so rapid is the increase of population, that not even the utilisation of all the parks and forests in England would provide food for the fresh mouths we may expect in the next ten years. There is such a thing as being penny wise and pound foolish, and the destruction of ancient woods and the cultivation of waste places would be dearly purchased by the increased disease and suffering, and greatly decreased enjoyment of life that would result.

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THE SEVENTH INTERNATIONAL CONGRESS OF HYGIENE.—Several parts of the "Transactions" are now completed and ready for delivery. As the whole will not be forwarded to members until the thirteen parts are ready, which cannot be for some months, we are requested to inform members that each part, as ready, will be sent to them upon prepayment of 4s., to cover the expense of wrapping and postage.

## NORWEGIAN ICE.

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THE ice trade between Norway and this country has developed so largely of late years that we think it may interest our readers to lay before them a few figures in connection therewith. We have taken some pains to arrive at these statistics, and they may therefore be fairly relied on as correct.

The average annual imports to London for the last four years were 120,000 tons, carried by about 220 vessels, of which some 25 were steamers, the remainder being sailing vessels. Of this quantity Christiania sends nearly one-half, Kageroe one-sixth, and the other Norwegian ports the remainder. The two largest London importers are Mr. Carlo Gatti, of the Arches, Charing Cross, and Messrs. Stevenson, of Billingsgate, who buy between them about one-half the quantity arriving here, the rest being consigned to about twelve other ice merchants in the metropolis.

The trade is chiefly done through agents in London, who receive from  $2\frac{1}{2}$  to 5 per cent. commission from the Norwegian shippers. The price paid here by the merchants for ice weighed from the ships to the carts or barges varies from 7s. to 10s. per ton in the spring, and from 10s. to 20s. per ton during other times of the year, being regulated greatly by the weather and quality of the ice. Some winters, being much less severe than others, produce comparatively thin ice; if it should not reach the uniform thickness of 14 to 16 inches, then the stock remaining in the Norwegian ice-houses from the previous year commands a good price. Of course, if the Norseman gets a very hard winter, somewhat of a glut is created in the market in the following summer, with a corresponding decrease in price; but we are afraid the small retail buyers rarely reap any benefit from Nature's plentiful additional supply.

The chief reason why the greatest quantity is shipped from Christiania or Drobak, which

is adjacent, is that the ice procured thence is considered the finest and realises the highest price in the market. That shipped from Krageroe, not being considered so good, is to be had at a cheaper rate.

### PUBLIC HEALTH REPORTS.

FULHAM; Medical Officer of Health, Dr. J. Edwin Cooney, D.P.H.—In no other parish within the metropolitan area has the population increased so enormously as in Fulham, situated in the south-west part of London. This parish, occupying an area of some 1,700 acres, and bounded as regards three-fifths of its extent by the river Thames, had in 1861 barely 15,000 inhabitants; in 1871 and 1881 the census showed a marked increase to 23,378 in the former, and 42,900 in the latter, year; and the recent census, 1891, gave a total of 91,640 inhabitants, the population having more than doubled (the actual increase being 113 per cent.) in ten years. It seems as if we were writing of an American city—a Chicago, or a Cincinnati—rather than of a London suburb. The number of houses in Fulham is increasing annually at the rate of 700, equal, say, to ten good-sized streets, and these are occupied almost as quickly as they are erected. The aggregate wealth of the parish exhibits a corresponding progressive ratio; for the ratable value, which was only £47,492 in 1856, when the Metropolis Local Management Act came into operation, was £426,551 last year. Further, we may mention a satisfactory fact in connection with the rapid growth of Fulham, viz., that the death-rate in this district, in 1891, was 19·74 per 1,000, being 1·66 lower than that of the metropolis as a whole. The birth-rate during the corresponding period was 38·2 per 1,000 in Fulham, 32·0 per 1,000 in London as a whole—another point contrasting largely in favour of Fulham. The ages at death under 1 year were 590, 56 of these being illegitimate children, the mortality

amongst whom is always excessive, owing to their being usually brought up by hand, besides being left to the care of strangers; the deaths of persons, 60 years of age and upwards, amounted to 373 during the twelve months.

As zymotic diseases are admittedly of a more or less preventable character, their relative prevalence may, in no small degree, be accepted as a test of the sanitary condition of a district. They may be arranged in two classes, viz., those notifiable under the Infectious Diseases (Notification) Act, 1889—small-pox, scarlet fever, typhus fever, relapsing fever, diphtheria, membranous croup, continued fever, typhoid or enteric fever, cholera, erysipelas, and puerperal fever, all of which are enumerated as “dangerous infectious diseases” under the Public Health (London) Act, 1891. The other class comprises diarrhoea, dysentery, measles, whooping cough, &c., which do not come under the Acts just named. Influenza and tuberculosis may, at no distant date, be classified as “infectious diseases.” The importance of the zymotic rate being fully admitted, Dr. Cooney is justly entitled to lay stress upon the immunity which Fulham enjoys, the ratio being far below that of the surrounding districts.

The returns made last year in accordance with the Infectious Diseases (Notification) Act amounted to 363 only, as against 577 in the previous twelve months.

The disinfection of bedding, &c., is carried out by Mr. G. Lacey, under a contract for a term of years. During 1891, more than twelve tons were disinfected at a cost of £173, money well laid out. Hitherto the disinfection of premises has been effected with sulphurous acid and carbolic acid. Dr. Cooney proposes to use perchloride of mercury in future, in the place of carbolic acid, as that salt is 200 times stronger as a germicide than carbolic acid is.

The provisions of various Acts of Parliament for the sanitary regulation of the metropolis have been thoroughly put into force in Fulham, to the obvious benefit of the locality. Writing



of overcrowding, and of houses reported as unfit for human habitation, Dr. Cooney mentions one case from which magistrates might deduce a salutary lesson, that of a dwelling house containing a large number of rooms swarming with Italians—many of whom did not understand the English language, or, at any rate, professed not to know it. It was with great difficulty, and after many warnings and summonses, that this house was closed. The simple way in which the clearance was eventually effected was by the magistrate fining one of the occupiers £5 or, in default, one month's imprisonment. The result was magical; the Italians, who previously failed to understand notices and admonitions, were able to appreciate the magisterial decision, and on the following morning they had vanished—gone, as clear away as a lot of rabbits out of a burrow when a ferret enters at the other end.

A careful inspection of bakehouses throughout the district disclosed the fact that out of 63, only 22 (barely one-third) were found to be in a proper sanitary condition; indeed, many were in a disgraceful state. Open drains, closets ventilating into bakehouses, and other similar nuisances, were discovered; while dirty walls and ceilings were, as Dr. Cooney remarks, the "order of the day." Prompt measures were taken, and in every case notices were served, requiring the occupiers to place not only the bakehouse, but the dwelling-house in sanitary condition. It may be observed, as evidencing the extent to which the baking trade in London has got into the hands of Germans, that the names of nearly thirty of the persons carrying on the business at the bakehouses referred to in the Report are unmistakably German. Possibly, too, this circumstance accounts in some measure for the unsatisfactory state of the bakehouses, for the majority of the names of persons proceeded against by the authorities are of Teutonic origin.

There are only seven private licensed slaughter-

houses strongly of opinion that private slaughter-houses ought to become a thing of the past. There is practically no supervision of them, and very few of the existing slaughter-houses in London are suited, or were even built, for purposes to which they are applied. Public opinion is ripening in favour of the abolition of private slaughter-houses and the substitution in their place of public *abattoirs*, specially constructed and under constant, competent supervision. The number of licensed slaughter-houses in London is now only 665, as compared with 1,500 in 1874; a diminution due, probably, as much to the large importation of foreign dead meat as to the force of public opinion.

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### NOTE ON SEA AIR.

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By Rev. R. A. CHUDLEIGH, M.A.

It is an article of popular faith that sea air owes its virtue to the large quantities of iodine and ozone with which it is believed to be laden. Honour to whom honour is due; and if the salubrity of the coast be really due to those two interesting elements, by all means let them have the credit of it. But one of the tests for iodine is starch, which it causes to assume a violet hue. And if iodine were present on the coast in anything like its reputed quantities, the "violet powder" with which ladies fortify their complexions, and which is composed mainly of starch, would soon become violet in colour as well as in scent. The absence of purple ladies from popular watering-places must be taken as proving an alibi for the iodine.

With ozone the case is different. There is no doubt that it abounds near the sea. The two principal generators of ozone are, first, electricity, and second, sunshine, acting on chlorophyll, or the green blood of vegetation. The former is likely to abound wherever there is friction of waves; but the latter would still more abound on heaths and downs, in woods

and fields. So far as quantity of ozone is concerned, the sea-beach may be far inferior to an inland glade. But to breathe ozone is anything but healthful. It begins with producing symptoms like those of influenza, and ends in death. Its virtue lies in its powers as a disinfectant. It is its purification of the air from putrescible matter, and not its respiratory value, that makes ozone beneficial.

### THE BANANA AND THE CACAO.

THE banana belongs to the genus *Musa*, and is one of the most important fruits produced in tropical countries. The banana or plantain, largely used as an article of food by the people of Central America, tropical Africa, and equinoctial Asia, is cultivated with ease wherever the mean temperature of the year exceeds 75 deg. F. It is very nutritious, and the quantity of land which will supply two persons with wheat will furnish plantains to satisfy the wants of fifty persons. Its leaves are used for thatching, and from the fruit is made an intoxicating beverage much liked by the natives.

The plantain is called the *Musa Paradisiaca* by botanists from an old notion that it was the forbidden fruit of the Scriptures; and fanciful writers have supposed it to be the fruit brought by the spies of Moses from the Promised Land—one bunch being carried between the two on a pole.

The soil of Costa Rica is peculiarly adapted to the cultivation of bananas, and the entire extent of the country from Limon to Carrillo, on both sides the railroad—some seventy miles—is given up to this culture. The bananas of Costa Rica are the finest imported into the United States. One of the chief merits of the bananas of that country is their superior hardness, the fruit always arriving in a perfect state of preservation in spite of the time required for its transportation; only within the last year or two some of the finest fruit on being re-shipped from New York to London bringing twenty-seven shillings per bunch.

The banana industry is organised on so perfect a basis that little trouble is experienced even in the shipment of the immense quantities sent from Limon. Several days before the arrival at that port of the buyers, a cablegram is received notifying planters along the railroad. The railway company then put on extra trains; the inspectors prepare for their task, and the Jamaica negroes and peons come ready to cut down the trees with their sharp machete—a knife or sword always worn by the natives and used for every imaginable purpose. Although the steamers engaged in this trade are of the largest size, they are always provided with sufficient freight at Limon, so enormously has the industry developed during the past few years.

The fruit business at present supplies the railway with the greater portion of its freight; and as the road is being rapidly extended and new areas being cultivated, the tonnage of the railroad company is constantly on the increase.

The first step in laying out a banana plantation is clearing the land. Holes about six inches deep are then made in the ground, generally at a distance of ten or twenty feet apart. The suckers, which are small shoots from the roots of the old trees, are then planted. In about ten or twelve months the tree attains a height of fourteen to twenty feet, on the top of which, apparently a prolongation of the trunk itself, hangs the heavy bunch of fruit destined to line the purse of the planter with bright dollars, and by its golden colouring to gratify the eyes of the lover of luscious fruit.

The tree has a diameter of eight or nine inches, and is peculiarly soft and watery. The fruit is gathered a few days before shipment, and is never allowed to ripen on the tree when intended for transportation. It is the duty of each train inspector to guard against the shipment of over or under-ripe fruit. The Costa Rica bananas which ripen off the trees are as delicately flavored as the bunches destined for home consumption and allowed to attain full maturity on the parent stem.



To obtain the fruit, the tree which produces only one bunch for the first crop is cut down. The second year increases the number of trees, as from each root spring several shoots, of which only five or six are allowed to grow. In a few years, if the land is rich enough to stand the drain upon it, the yield is enormous. While some plantations show no deterioration in the size or quality of the fruit, others, at the end of four or five years, fall off in the size of their bunches, and prove the necessity of applying some fertiliser—an article hitherto unused; the cut trees are left on the ground, and as they decay rapidly, serve for fertilisation.

Two hundred bunches can be obtained to the acre. A bunch, or cluster of the fruit, will often weigh as much as 50 pounds. The profits must seem enormous, when one reflects that some plantations return a net gain of from 60 to 80 per cent. per annum on the original cost. Others do not pay so well, but when attended to at all, it is certainly one of most profitable crops known.

Some planters provide against the exhaustion of the soil by setting out other trees between the bananas, so that when a rotation of crops is necessary, they will have another of cacao, or whatever else they may have planted.

Around Matma the cacao tree has been in cultivation many years, and the soil of Costa Rica is well adapted to the production of this valuable article.

When the Spaniards invaded Mexico they found that the natives indulged in a most delicious beverage, of which they themselves were ignorant. Tradition tells us that the Emperor Montezuma drank chocolate flavoured with vanilla from a golden cup. It is fortunate for us moderns that the cacao tree is now largely cultivated throughout Spanish America, and that in Costa Rica it is properly prepared. In a short time there is no reason to doubt that chocolate will form an important article of export from that country along with the tropical fruits for which it is already famous.

The cacao or theobroma must have been the nectar of the gods—theos, a god; bromo, a fruit—fruit for the gods, by a natural deduction. One can hardly doubt that when they assembled in solemn conclave on high Olympus the loving cup, passed from one to the other, was filled to the brim with foaming chocolate. From being cultivated only in Mexico, its native country, cacao is now grown in nearly all the Spanish American States as well as in the West India Islands.

Cocoa and chocolate are both prepared from the seeds of the cacao. The pods containing the seeds are gathered when ripe, and having lain for a day and night are opened, and the seeds, extracted by hand, are submitted to the sweating process. They are placed in baskets laid on sloping floors, in order that the chief part of the pulp may drain off; after this they are shut up in a close box for twenty-four or forty-eight hours, and are then laid in the sun to dry. When quite dry, the seeds are packed in bags for shipment. Chocolate is prepared by grinding the cocoa-nibs in a mill consisting of stone or metal rollers, heated by charcoal fires or steam, for the purpose of softening the natural fat. The warm smooth paste which issues from the mill is incorporated with sugar and flavoured with vanilla—becoming the chocolate of trade. The Costa Ricans, although they fail in making a good cup of coffee or tea, succeed admirably in preparing chocolate, of which they drink great quantities. Mixed with parched corn, and served cold, it makes a most refreshing drink.

The cacao tree grows to a height of twenty feet, and has a hard trunk. In about six years it arrives at maturity, lasts well, and produces largely.

C. R. S.

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A JOCKEY'S DIET, when in training, is as follows:—Breakfast—a small piece of bread and butter, and one cup of tea. Dinner—fish; if fish cannot be procured, a little bit of some light pudding, and very little meat. Tea—same as breakfast. Supper—nothing. He goes to bed at nine, and rises at six. His medicine, if he should require any, is Glauber's Salts; and his usual beverage is wine and water, in the proportion of two parts of the latter to one of the former, taken sparingly.

## Reviews and Notices of Books.

*Middle-Class Organisation.* By COSMO ROSE-INNES. Pp. 68. Crown 8vo. Price 6d. Beaumont & Co., Limited, 39, Southampton Street, Strand, London.

THE author, who is well known as a barrister of position, has written this pamphlet with the avowed intention of showing the want of cohesion and combination among what is often spoken of as "the great middle-class," and the consequent results, namely, that their helplessness in this respect causes them to fall easy victims to Chancellors of the Exchequer, and to have far more than their proper share of taxation thrust upon them. The upper and richest class are well able and equally ready to protect themselves; that goes without saying. The working class have their powerful Trades Unions to look after their interests, but the middle-class are comparatively helpless, so that their interests are often disregarded.

The incidence of taxation has tended for years past to fall more and more upon this class; take the income tax for example. Out of a total of thirteen millions of pounds obtained from this source by the Government in 1890-91, upwards of seven millions were derived in connection with Schedule D, Trades and Professions, representing the middle-class income tax; if to this sum be added a proportion only of the income-tax on occupation of land and on annuities, dividends, etc., it will at once be seen that more than half of this enormous impost, rightly spoken of by Mr. Rose-Innes as "the most obnoxious," is drawn from members of the middle-class. On the other hand, Schedule A, on land and dwelling-houses, brings in rather less than four millions sterling. In respect of this burden, as, in fact, of all other taxes, it is high time that the middle-class began to appreciate its real position, and to insist upon a fairer apportionment of taxation. To this end,

Mr. Rose-Innes has<sup>1</sup> successfully laid the foundation of a taxpayers' or middle-class organisation, unconnected with any political party. Amongst its chief objects are a readjustment of the income tax, the abolition of sinecures, the promotion of economy in all State departments, and the taxation of ground-rents.

Mr. Rose-Innes says much which is interesting and worth reading on these and many other matters, such as mineral industries and royalties, land and leasehold enfranchisement, pauper immigration, and City Companies with their waste of funds that have accumulated to an extent beyond the possibilities of the wildest dreams of the original testators. Speaking of these huge and often misapplied funds, Mr. Rose-Innes says that the period has arrived when the revenues of the City Companies should be administered for national purposes. "Here," he remarks, "is a magnificent source of income waiting to lighten the burden of the taxpayers, and being in the meantime frittered away in gorgeous mummery and jobbed upon senseless sinecures."

Every taxpayer should buy and carefully peruse this pamphlet.

*Annali dell' Istituto d'Igiene Sperimentale dell' Università di Roma.*

THROUGH the kindness of our esteemed correspondent, Professor Angelo Celli, well known as an eminent sanitarian, we have received a complete set, from their commencement, of the *Annals of the Institute of Experimental Hygiene*, which has the good fortune to have Professor Celli at its head. The Institute is connected with the University of Rome, and is, we need scarcely say, of great value in promoting research in various branches of hygiene. The *Annals* are now published in quarterly parts, forming a large volume yearly, profusely illustrated with engravings and chromo-lithographic plates. Amongst the numerous subjects dealt with during the past twelve months are bacteriology, the



purification of water (Dr. A. Serrafini), the action of the fumes of tobacco on pathogenic organisms (Dr. Jussinari), the carburation of illuminating gas, regarded from a hygienic point of view (Serrafini), tetanus (Professor Sormani), the history of typhoid fever in Catania from 1866 to 1886, showing the importance of the sanitary conditions of the city during that period (Professor di Mattei) parasites of man and animals (Professor Celli and Dr. Sanfelice), the quantitative analysis of animal gelatine (Scala), and the products of vegetable decomposition (Dr. Santori). We shall have occasion at a future time to refer at greater length to these valuable hygienic contributions. It may be mentioned here that the yearly subscription to the *Annals* is only 18 lire (about 15s. English).

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The *Revista Internazionale d'Igiene*, which, by the way, does not reach us so regularly as it formerly did, is a monthly periodical published at Naples, under the able direction of Prof. Eugenio Fazio, Lecturer on Hygiene in the University of Naples, with whom are associated a considerable band of sanitarian contributors, representing the principal Continental countries. The *International Review of Hygiene* contains in every number original articles of marked interest. Annual subscription, 12 lire (about 10s. English).

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ANOTHER Italian journal amongst our foreign exchanges is *La Terapia Moderna*, which, as is implied in its name, deals chiefly with clinical medicine and experimental therapeutics, and is edited and written mainly by professors and members of the University of Padua, though it includes amongst its contributors many other Italian physicians and scientists. Prof. V. Chirone, director of the Pharmacological Institute connected with this ancient University, is also the director of *La Terapia Moderna*.

THE *Revue Internationale des Falsifications* is the official organ of the International Commission for the prevention of the adulteration of foods, etc., and will complete its fifth year in the present month (July). It is published at Amsterdam; chief editor, Dr. P. F. van Hamel Roos. The staff of contributors comprises representatives of almost every civilised country throughout the world, those for England being Professor Dr. E. Frankland and Mr. Charles E. Cassal, F.C.S. The last number to hand contains reports on adulteration in Germany, the United States and France, articles on the adulteration of tea and coffee, and on the falsifications of butter by margarine, with other interesting matter. We learn from this periodical that stringent regulations concerning the trade in milk have been put into force during the last few weeks at Dusseldorf. According to the new arrangements all milk offered for sale must be divided into two classes, namely skimmed and unskimmed. Unskimmed milk is defined as that which is in the same condition as when it has been obtained from the cow, and which does not contain any added substances; specific gravity of 1.028 to 1.034 at 15°. The quantity of solid matters ought not to fall below 11 parts per cent., that of fat below 2.75 per cent. All vessels in which milk is exposed for sale must be legibly marked "unskimmed" or "skimmed" milk, as the case may be. The sale is prohibited of milk procured from cows which have calved within eight days previously, as well as of milk which is blue, reddish, yellow, or glairy. The prohibition extends also to the milk of cows attacked by grave general diseases, and to milk containing preservative substances of any kind whatever. Persons attacked by contagious maladies, or who are thrown into company with other persons similarly attacked, are ordered to abstain from milking cows, from serving in a dairy, or from engaging in any other way in the sale of milk.

## Notes and News.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—As many of our readers are aware, a long legal struggle has been carried on between the Association of Members of the College and the Council, as to the right of the members to have a direct representation of their body in the Council and other similar privileges. The requirements of the Association erred, if anything, on the side of moderation, and the action taken by the Association received general endorsement and approval, not only from the members of the College, but from many persons outside of the profession, who acquiesced in the opinion that the time had arrived for a reform in the constitution of the governing body; and a Chancery suit was instituted, technically "*Steele v. Savory*" (these being the names, respectively, of the honorary secretary of the Association and of the president of the College at the period when the action was begun), and practically "*Association v. Council*." The result has been that, after a protracted suit, Mr. Justice Romer gave a decision against the Association, and the committee of that body have, upon consideration, come to the determination not to appeal against Mr. Justice Romer's decision. Thus the present struggle is at an end, though, as has been clearly shown by our medical contemporary, the *Lancet*, the adverse decision on the special points raised in the pleadings does not in the least degree affect the soundness of the principles on which the demand for reform of the College of Surgeons is based. Indeed, it should be productive of future benefit to the members, because it has exposed the existing anomalies, which are wholly opposed to common-sense, fairness, and progress. The charters and by-laws of the College were drawn up at such a remote period that they necessarily require remodelling. If the members are true to the principles which dictated the recent contest against the narrow and exclusive government of the College, the reforms which they desire must be brought about in the long run. It is not the first time that the battle of *Right v. Might* has gone wrong in the Law Courts through the circumstance that more importance is attached, especially in the Chancery division, to the interpretation of legal documents, than to questions of principle. What has now to be done is for the members of the College, of whom there are many thousands, to strengthen the Association by joining it, if they have not already done so, and further to give evidence of their practical sympathy by contributing towards defraying the heavy expenses of the action, about £2,000. Any donations for this purpose should be at once sent to Dr. G. Danford Thomas, Park Lodge, Paddington, W. (Coroner for Middlesex), who has consented to act as treasurer to the special fund.

THE SUPPLY OF WATER TO LONDON IN THE NEAR AND THE DISTANT FUTURE.—Under this title the *County Council Times* has published two very valuable articles from the pen of Mr. J. Logan Lobley, F.G.S., one of the contributors to *HYGIENE*. Mr. Lobley demonstrates how by increased storage on the part of the eight metropolitan companies (limiting their withdrawal of water from the Thames to the present average per diem of 100,000 gallons, and from the Lea to 55,000 gallons), and by more thoroughly utilising the supply derivable from the chalk beds around London, an aggregate supply could be obtained, giving over 31 gallons per head to a population of

8,000,000. Moreover, the admixture of the water from the chalk with that derived from the two rivers named would, Mr. Lobley asserts, tend to an improvement in the quality of the supply. Those who perused the several articles on the London water supply, which appeared in *HYGIENE* last year, will learn with satisfaction that Mr. Lobley, whose rank as a geologist is of the highest order, supports the statement then made, and received by some with considerable incredulity, that 30,000 gallons daily of the purest water could be obtained from Mr. George Webster's pumping stations near Rickmansworth, and in the immediate locality, without prejudice to the interests of the districts through which the Colne and its tributaries flow. Mr. Lobley lays too much stress on supplying London in great measure from the Thames, a supply which we spoke of in our last issue as "always dear, often dirty, and occasionally dangerous."

CROWDED CHURCHYARDS.—The Hornsey churchyard has been used for interments during the past six hundred years. During the present century 15,000 burials were made in it. It was partially closed in 1872, by an Order in Council, but though no new graves have been permitted since then, burials have been allowed in the old graves; these have gradually dwindled down from forty-one in 1881 to twelve last year. At a recent inquiry, held by Dr. Hoffman, H.M. Inspector under the Burial Acts, it was stated by the sexton that in opening the old graves portions of human remains had been dug up, and that the graves were nearly all full of water; a similar condition of things existed as regards the vaults, in which the coffins could be seen floating about. The churchyard was bounded on two sides by land which was originally fields, but had been converted into building plots, on which some 200 houses will shortly be erected. It is a significant fact that the churchyard, although it was at one time on the same level as this building land, is now raised four feet above it. The natural soil of the churchyard is a dense, stiff, yellow clay, and there is no artificial drainage.

THE DISCOVERER OF THE MICROSCOPE.—M. Govi, an Italian savant, claims for his countryman Galileo the distinction of having discovered the microscope as well as the telescope. He has found a book printed in 1610, according to which Galileo had already directed his tube fitted with lenses to the observation of small near objects. The philosopher himself stated, shortly after this date, that he had been able to observe through a lens the movements of minute animals, and their organs of sense. In a letter, written in 1614, he states that he has with his microscope "seen and observed flies as large as sheep, and how their bodies were covered with hairs, and they had sharp claws." The date usually assigned to the discovery of the microscope is 1621, and the invention is attributed to Cornelius Drebbel, a Dutchman; but according to M. Govi the date must be thrown back eleven years, and the credit of its first construction awarded to Galileo.

VINEGAR.—The best and most wholesome vinegars are those made from cider and wine. These retain suggestions of the apples and grapes from which they originally came. If carefully kept they remain palatable for an indefinite period; if carelessly, they, like every good food-substance, are apt to become mouldy and unwholesome. From a gastronomic standpoint the best vinegar is that which is made from red wine next to it are those that are made from white wine



cider, and perry. The first is invaluable in salad dressing, on account of its beautiful colour; the second is most useful in those preparations where no colour at all is desired; the third is available for all general use; and the last comes to the front whenever the delicious jargonelle flavour is conducive to the culinary success. Below this class are the vinegars made from ale, beer, and whiskey. These are coarse, heavy, and often offensive.

TAXES ON THE DISSEMINATION OF KNOWLEDGE have to a great extent been abolished, but there remain some of an indirect character from which considerable injustice arises. We refer especially to the postal charges upon periodicals like *HYGIENE*. If a paper is published weekly, and if it contains a certain proportion of news to other matter, it can be transmitted without regard to weight or bulk to any address in the United Kingdom by affixing a half-penny stamp, but if it is produced at less frequent intervals, or if other matter preponderates over so-called news, the postage is raised to a penny. On a score or two of copies this additional charge makes, of course, but a trifling difference; when we come to reckon in thousands it becomes a heavy and serious impost. For instance, *HYGIENE*, being a monthly publication, cannot be sent by post under a penny. This means that for every 10,000 copies forwarded from our office through the medium of the Post Office we have to pay £20 16s. 8d. in excess of what should be paid if the Post Office authorities accorded us fair treatment, and it further means that, owing to the inequitable restrictions which at present prevail, the proprietors of *HYGIENE* have been overtaxed to the extent of hundreds of pounds since its establishment. If *HYGIENE* had been during the several years of its existence a weekly publication, constituting a newspaper, by reason of its containing details of some horrible murder, the minutest particulars of some filthy divorce case, statements of the ravages of some widely-spread epidemic, and so on, it would have been permitted to pass anywhere throughout the kingdom for a halfpenny. But, as Mr. Henniker Heaton, M.P., the indefatigable and energetic postal reformer, has pointed out in one of his speeches on this subject, *HYGIENE* being a monthly periodical of admitted high character and public utility, which, instead of merely alarming its readers unnecessarily by informing them of the mortality from an epidemic, instructs how to ward off its attacks, the authorities impose the penalty of a higher rate of postage. Such a course is wrong, is opposed to every notion of fairness, and is absolutely indefensible. In June of last year an influential deputation of newspaper proprietors and editors had an interview with the Postmaster-General (the late Hon. H. C. Raikes, M.P.), who promised to give the subject of unfair postal charges his careful consideration, and who would, we have reason to believe, have done something to remedy the evils complained of. His death soon afterwards brought another official into his position, and as no steps were taken by the department at St. Martin's-le-Grand to redress the grievances, another and still more important deputation (some seven hundred papers being represented) had a second interview with the present Postmaster-General last month. Mr. Henniker Heaton, M.P., introduced the deputation, as on the previous occasion, and the speeches made by himself and subsequent speakers were fully convincing as to the urgent desirability of a change from the existing arrangements. It is a matter which should, and doubtless will, be rectified by the new Ministry, whichever side may come into power; for it is not a party, but a public question.

SOUP FLAVOURED WITH HENBANE reminds one of the mysterious crimes committed in centuries gone by, but in those the poisoning was intentional. The sanitary authorities for Paddington have found it necessary to warn purchasers of celery seed for flavouring purposes that a serious mistake has been detected, three bottles of supposed celery seed out of twenty-four purchased by a local greengrocer from a wholesale dealer in Covent Garden having been found to contain, in two nothing but henbane seeds, and in the third only 10 per cent of celery. Several persons were seized with alarming symptoms of poisoning after partaking of soup flavoured with these supposed celery seeds. Mr. Alfred W. Stokes, F.I.C., F.C.S., public analyst to Paddington and various other metropolitan bodies, was requested by Dr. James Stevenson, Medical Officer of Health for Paddington, to make a microscopical examination and analysis of the contents of the three bottles. What has become of the others will be the natural inquiry after reading the subjoined report of Mr. Stokes:—

"One bottle, that from which the poisonous dose had been taken, contained 3 oz. of seeds; each of the others  $3\frac{1}{2}$  oz. of seeds. The first bottle contained in 10,000 parts by weight only five parts of celery seeds, the rest being henbane seeds. Another bottle in 10,000 parts contained 106, and the third 40 parts of celery seeds, all the rest being henbane, so that for practical purposes two of the bottles were filled with henbane seeds, the largest proportion of true celery only amounting to 10 per cent. in the other bottle. There is no doubt whatever that the seeds are those of henbane. The active ingredient, hyoscyamine, is present in a rather larger proportion in the seeds than in the leaves, which are directed to be used by the British Pharmacopœia for producing the various preparations of henbane. The drug is a very powerful poison, the full dose of hyoscyamine being only one-tenth of a grain.

"Since two teaspoonfuls of the seeds used to flavour the soup produced more or less poisonous effects upon four people partaking of it, we may realise the power for evil of the original twenty-four bottles. A teaspoonful of the seeds weighs only thirty-six grains, hence each bottle would contain over seventy-two teaspoonfuls. The seeds were in bottles of dark coloured glass, so that the colour and form of the seeds would not be noticed without taking them out. Even then, though very different in form, they are so small that their difference would easily escape notice, as in this case. It is impossible that in gathering the seeds any mistake could have been made; the plants are so entirely different. The presence among the henbane seeds of so small a quantity of celery seeds is apparently an accident. Probably it was by inadvertence, the bottles not being labelled, that twenty-four bottles of henbane seeds were supplied instead of celery seeds. It is hardly likely to be a matter of adulteration, else the celery seeds would certainly have formed a fair proportion of the whole. Any one in the seed trade examining the seed would have at once noticed the mistake. Though now further mischief has been stopped, it is not pleasant to contemplate what may have resulted from the large bulk of that stock of henbane seeds sold as celery, still unaccounted for, and of which these twenty-four bottles were only part."

NATIONAL HEALTH SOCIETY.—The annual report shows a great increase of work during the past year. The Society has met with much success in sending, under the auspices of different County Councils, competent lecturers to numerous towns and villages to give practical discourses on Nursing, Health, and Cookery.

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## PATENT MEDICINES.\*—No. 13.

ELECTRIC BELTS; NICHOLSON'S PATENTED ARTIFICIAL EAR DRUMS; PROPOSED SOCIETY FOR THE SUPPRESSION OF QUACKERY; ST. JACOB'S OIL; MOTHER SEIGEL'S SYRUP; MATTEI'S ELECTRICITIES.

"Gullible, however, by fit apparatus all publics are; and gulled with most surprising profit."—*Carlyle*.

WHEN the Sage of Chelsea penned these lines, in "Sartor Resartus," he must have enjoyed a cynical chuckle over the Publics who allow themselves to be taken in by the swindling "arts of Puffery and of Quackery," the "grand overtopping Hypocrisy," as he writes further on. Little wonder, indeed, is it that he reckoned up these blind believers in quack advertisements and nostrums as "mostly fools!" By "fit apparatus" he meant, of course, the means devised for trapping the large class of the public who put faith in the patent *alias* quack remedies.

For our present purpose, however, we will take the word "apparatus" in its narrowest sense. An able writer in the *Provincial*

*Medical Journal*, whom we have the pleasure to include among the contributors to *HYGIENE*, speaking of electric belts, describes the case of an unfortunate man, a labourer, dying from cardiac dropsy, and so poor that he could barely get food enough of the humblest kind, who was persuaded by his credulous neighbours to lay out his little all in the purchase of a much-vaunted and extensively-advertised electric belt. Of course, the man derived no benefit from his purchase, and soon afterwards died. Our friend got permission from the relatives to examine this *precious* apparatus, after the decease of the poor dupe. What did it turn out to be? Why, half a dozen discs of tin, as big as a florin, neatly sewn into a flannel belt, not worth as many farthings as the poor fellow had been robbed of shillings. Yet these fraudulent apparatus are advertised in the leading papers, journals which would decline to insert announcements of most of the quack remedies in vogue. The *Graphic*, for instance, had not long since, in its advertising columns, a long rigmarole about electric treatment, commencing with a "magneto-galvanic sleep promoter" at two and a half guineas, and winding up with "the electro-spiral hood to keep life in patients dying from exhaustion until the treatment has time to take effect. Price £500"! Great Scott! Which is most to be wondered at? The mendacity of the adver-

\* The articles on this subject which appeared in *HYGIENE* for 1891, have been reprinted and published in book form under the title of "Patent *alias* Quack Medicines"; 3rd edition, 128 pages, price 1s., post free for 14 stamps. (Beaumont and Co., Limited, 39, Southampton Street, Strand, London.) During the present year articles have appeared on Beecham's Pills, Warner's Safe Cure, Morrison's Pills, Baillie's Pills, Dixon's Pills, Lee's Pills, a Quack Libel Case, Modern Mysticism and Mattei's Electricities, etc.



tisers, the folly of the purchasers, or the weakness of the publisher of a high-class paper in allowing its columns to be made the medium of such a palpable imposture? And this sort of thing goes on day by day, week by week, and month by month, in hundreds of papers bearing a high character for respectability and veracity—religious papers being the greatest offenders, a circumstance from which an unbiassed observer might deduce the conclusion that their readers are not of the most intelligent classes—until one blushes for journalism. Indeed, the electro-magnetic charlatans find ink and paper such a profitable investment that they run papers of their own, for the sole purpose of puffing their own wares, while at the same time they make desperate onslaughts upon each other. Thus, *Modern Medicine*, a monthly periodical, published in London, endeavours to convey to its readers that Matteism and miracle working are convertible terms, and wild wagers are offered, asserting that the Mattei electro-homœopathic remedies will promptly cure every known malady. But let us shift the venue from London to Geneva, and we find there a so-called Electro-Homœopathic Institute, whence issues a monthly magazine printed in English, devoted to electro-homœopathy and to damaging attacks on Mattei. Some of these are not wanting in humour. For instance, a letter is given, written by Mattei in 1876, to a newly-appointed agent, showing that Mattei more than makes up for his want of scientific knowledge by his superabundant bombast. The translation is as follows:—“Assuredly you will not lack gold or millions. You will attract it as a magnet attracts iron. You have the magnet in your intelligence and your activity. Farewell, my dear sir; work with your ability, and I guarantee a good result.” How is that for high? As a specimen of lofty rhodomontade we know nothing to equal it. Hannibal crossing the Alps, Drake setting out to encounter the Spanish Armada, Napoleon on his march to Moscow,

could scarcely have used more inspiring words. But, though they have a ring about them, it is a false ring, brassy in sound, inspired only by a desire for filthy lucre. But, as Burns said, “The best-laid plans of mice and men aft gang a-ga’e.” When the agent had spent much money in advertising—that goes without saying, as it is a quack medicine we are writing about—and had given much time and trouble to the business, Mattei picked a quarrel with him, refused to pay the agreed commission, and was, says his agent, Mr. Sauter, guilty of meanness and injustice. However, this kind of treatment of his agents, judging by the numerous instances quoted by Mr. Sauter, is as much part of the Mattei method as the globules are. The only pity is that these rivals do not imitate the famous Kilkenny cats, and annihilate each other, instead of perseveringly obtaining the sinews of war from their deluded followers.

Passing from electric to aural apparatus, we may refer to a much-advertised instrument for the complete eradication of deafness. Some years ago, an acquaintance, a London solicitor, consulted us for deafness. In the course of the consultation it came out that, attracted by an advertisement, he, although in a profession which ought, like freemasonry, to have taught him to be cautious, was “fool enough” (we quote his own words) to spend we forget how many guineas upon the purchase of “Nicholson’s Patented Artificial Ear Drums,” *gold*, of course! Finding his hearing seriously impaired by their use he had flung them away, so that we had no opportunity of seeing them. The medical gentleman whom we have already referred to in this article has communicated to us a description of some which he examined, as follows:—“Two straight pieces of gilt brass wire, three-quarters of an inch long, one-sixteenth thick, and with a roughly-made knob and a disc of thin india-rubber, half an inch in diameter, at each end; a little loop of silk cord to hold it by. The

purchaser is directed to wet one of these instruments with a lotion (charged extra), containing glycerine, ether, and morphia, and to thrust it into the ear, 'until the natural drum is reached, and the end with the large disc well set into the outer ear.' It makes one shudder to look at it, and still more to think of the mischief, aural and cerebral, it may do, and is certain to do, if left in the meatus." The injury caused to thousands of people who were inveigled by advertisements and testimonials into investing many more thousands of pounds in such worthless, dangerous apparatus, must have been incalculable. Yet Nicholson was allowed by the police and by the Medical Council to go on for a considerable space of time (several years) advertising in metropolitan and provincial newspapers for dupes, from an address in one of the principal squares of central London, more often than not styling himself "Dr." Nicholson. Eventually, he formed a limited liability company, drew most of the cash, and then vanished. There are laws for the repression of theft and fraud, and societies for every available purpose, including putting down begging and imposture. Why should not a society be established—seeing that the authorities are too supine to do their duty—for the suppression of quackery? Our esteemed correspondent puts this important question, and suggests that the public mind might be usefully instructed by placards worded somewhat as follows:—

—————'S PILLS

are made solely of

CAPE ALOES (a cheap inferior kind),

GINGER,

and SOAP!

This mess costs about 4d. per lb, and each pound will make

2,000 PILLS!!

which have much the same composition as

HORSE-BALLS!!!

Why should people be such

ASSES

as to buy at many times its commercial value this dangerous drastic purge, and to believe that it can cure

ALL DISEASES?

—————'S OINTMENT

is nothing but a mixture of

LARD and COMMON ROSIN,

a pennyworth of which fills about

TWENTY of the POTS

which silly people buy at 1s. 1½d. each. Use your own judgment as to its value. Can any intelligent person believe that this grease will cure every affection?

Certainly, this suggestion is novel, and such additions to our mural literature would startle, if they did not convince, while the quack would be encountered with his own weapon, "bold advertisement." However, we think that the best way to combat quackery is to open people's eyes by articles like those now appearing in *HYGIENE*, by putting into effect the laws against fraud, misrepresentation, and obtaining money under false pretences, and by agitating for a modification of the Patent Medicine Law, so that every patent medicine bottle, box, or packet issued shall be required to have placed conspicuously upon it a label setting forth its actual composition. The sale of patent medicine stamps might be diminished by such a salutary regulation; but the term "patent" would then be a reality instead of, as at present, a ridiculous misnomer, while the loss to the Revenue would be a trifle as compared with the saving of public money, and even of life.

It would seem that at least one patent medicine proprietor desires a change from the existing misleading system. Turning over a country newspaper lately, we noticed, artfully mixed in with items of news, a curiously worded advertisement of a particular oil. It was headed "A Difficult Case," and had at the top of it a wood-cut illustration of a judge seated on the bench, and looking very grave and perplexed. The advertisement is couched in the anecdotal style now much affected by patent medicine vendors, and commences thus:—"There is a certain learned judge who sits in one of the London High Courts of Justice, who says that patent medicines, or—what he is pleased to term them—



'quack medicines,' should never be used, except on the advice of a medical man. The judge may be correct as to the large majority of patent medicines, but there are exceptions to this rule." "Pleased to term them;" the subject is not a pleasing one, at any time, but if a judge in court was pleased to call patent medicines by any other name than quack medicines he would sacrifice his reputation for truth and discernment. The exception to the rule is, according to the advertisement, St Jacob's Oil; and details are given of the case of a young man living at a village near Uppingham, with the avowed intention of proving this assertion. The narrative states the symptoms were of a rheumatic character; that the patient was under the treatment of the family doctor from January, 1883, to October, 1886, when he gave the patient up as beyond his skill and ordered him to be sent to the Leicester Infirmary; that, at the end of two weeks, the patient was discharged from the Infirmary as incurable; and that, as a last resource, he was placed under the care of a celebrated physician in Leicester, where he remained for a long time, but continued to get worse. Finally, his case having been pronounced incurable by "some of the most celebrated medical men in the Midland counties," a few bottles of St. Jacob's Oil were bought, at the instigation of a neighbour, and after applying the contents, the patient was able to get about on crutches, becoming perfectly cured by January, 1888. The cure is spoken of as "miraculous," but we do not attach much importance to this expression, as it commonly occurs in patent medicine advertisements. Indeed, we are not sure that we should have given a second thought to the matter, but for the circumstance that the advertiser complains that "the preparation in question" is "under the ban of a patent medicine." What does he mean? We presume that he objects either to the alternative name "quack medicine," or to the judge's opinion that, being such, it ought only to be used on

the advice of a qualified medical practitioner. If the judge's ruling were followed, the manufacture of St. Jacob's Oil would sink at once into insignificance, for any medical man would be culpably indifferent to his patient's interests as well as his own professional character if he prescribed St. Jacob's Oil, seeing that this marvellous, miracle-working preparation is made of common ingredients possessing no remarkable curative properties, as will be shown presently.

Having a better acquaintance with medical men in the Midland counties and elsewhere than the proprietor of a quack nostrum could be expected to possess, we were curious concerning the "most celebrated" who had, in sporting parlance, thrown up the sponge after futile struggles with the mysterious ailment, so marvellously cured, and we asked a friend to write to the patient's father inquiring their names. The reply, dated July 19th, 1892, was as follows:—

"In ancy to yours of this morning which we recevd, you ask me to state the case of my son the treatemt he receved at Leicester was at the infermery and from an old Docker which has past away since then, and then he" (the son, we imagine, not the Docker), "was sent to the Devenshire Ho-pital Buxton and from their he was sent home quite a chrple on crutches, and was al formes and then i put the oil and i have the same greate faith in them as i always have one."

It is a singular misfortune that, like "the Docker" referred to in the foregoing epistle, the doctors whose professional reputations are so mercilessly marred in quack testimonials die before the testimonials have wide circulation; but our readers who have by them the reprint of the first series of articles on Patent Medicines will remember that it was a still greater misfortune to the proprietors of Mother Seigel's Syrup that they assumed that a certain doctor had passed away in one sense when he had only done so in another, for he had merely changed his residence. They published a testimonial from a railway guard, containing damaging and untrue statements concerning "the late Dr. Dacre Fox." The "late Dr. Dacre Fox"

brought an action against the proprietors of Seigel's Syrup at the Leeds Assizes, and after the judge (Mr. Justice Lawrance) had summed up the evidence, the jury promptly gave a verdict for the plaintiff, damages £1,000. Subsequently the defendants obtained stay of execution only by paying £1,000 into Court, pending an appeal which was heard in the Court of Appeal before the Lord Justices Lindley, Bowen, and Kay. The Court saw no reason to either grant a new trial or to reduce the damages, and the appeal was therefore dismissed with costs.\*

It is also a singular misfortune that the people from whom patent medicine proprietors get such unstinted praise are usually persons—we will not use the hackneyed phrase, whose education has been neglected—who have as obvious a disregard for grammar and literary correctness as the patent medicine proprietors themselves have for veracity. If the case were otherwise, we might get more coherent and reliable statements of facts, and thus have a proper opportunity of forming definite opinions.

To return to the question of the composition of St. Jacob's Oil. What does this miracle-working St. Jacob's Oil really consist of? Some, perhaps, will conjecture that the costliest, the choicest, the most delicate essences must be united to constitute so marvellous a remedy. But if so, then Dr. Selkirk Jones must surely have made some mistake. He writes:—

In accordance with instructions, I have purchased a bottle of St. Jacob's Oil from a chemist here, and have submitted the same to a careful qualitative analysis. I find the contents comprise oil of turpentine chiefly, in which is dissolved ordinary camphor, and scented with an essential oil (most probably oil of thyme).

As a medical man I am of opinion that this Oil possesses no special therapeutic value, but, as in the case of ordinary embrocations (such as the Compound Camphor Liniment of the British Pharmacopœia) the relief afforded to the patient by its use is derived principally from the mode of its mechanical

application, whereby rubefaction is produced and blood circulation accelerated. Indeed, this Oil may be regarded as an ordinary stimulating application and *nothing more*.

GEORGE SELKIRK JONES, Ph. D., L.S.A., etc.

Horsham, July 21st, 1892.

According to the Old Testament, Jacob was badly used by his future father-in-law, but the treatment he received at Laban's hands was trifling as compared with the indignity heaped upon him (after dubbing him Saint, too) by appropriating his name to a mixture of common, vulgar "turps," crude camphor, and oil of thyme, and adding insult to injury by claiming for such stuff that it possesses miraculous powers!

"Turps" do cost money, though, as any house-painter would tell us, so that St. Jacob's Oil may be regarded as of higher commercial value than Mattei's Electricities. It will be remembered by many of our readers that in one of the earliest of our articles on Patent Medicines we published an analysis made by Mr. A. W. Stokes, F.C.S., of these—from one point of view, at any rate—unparalleled specifics; so miraculous in their action that, according to some of Mattei's dupes, when administered in doses of a few drops, they will cure cataract, and unite broken bones! Mr. Stokes' analysis showed that the so-called electricities were water—"nothing more," as the old song says. We were loaded with anonymous abuse and threatened with legal consequences, but, somehow, as in other instances of our publishing analyses of quack medicines, our anonymous assailants turned out to be of the Bob Acres' stamp. Mr. Stokes, too, stood firm as to the accuracy of his analysis. The following analysis and report furnished by Professor Michaud, chief of the Cantonal Laboratory of the Department of Justice at Geneva, bears out to the very letter all that Mr. Stokes reported:—

Analysis of five phials of Mattei's Electricities obtained from Mattei's depository, June 9th, 1892.

The examination of the five different phials has given the following results:

About fifteen grammes of a colourless liquid, without odour or flavour.

\* Full particulars of this interesting libel action will be found in "Patent *alias* Quack Medicines," 3rd edition, pp. 114 to 118.



Chemical composition *identical* with that of *pure water*.

Contains deposits similar to those of stagnant water tainted.

The microscopic and physiological examination confirms the chemical analysis as well as a previous analysis made by Professor Stokes of London who declared the *therapeutic value* to be *negative*.

Mr. Stokes's conclusions seem to me to be *conclusive*.

L. MICHAUD, Professor,  
Cantonal expert in Chemistry.

Geneva, June 11th, 1892.

Water, "honest water" as Shakespeare designated you in *Timon of Athens*, to what base uses are you put when you fall into the hands of a quack!

THE EDITOR.

## PRECAUTIONS AGAINST THE INFECTION OF CHOLERA.\*

General Memorandum drawn up by Sir GEORGE BUCHANAN, M.D., F.R.S., late Senior Medical Officer, Local Government Board.

1. The Order of the Local Government Board, of July 12th, 1883, gives certain special powers to the Sanitary Authorities of the sea coast, enabling them to deal with any cases of cholera brought into port, so as to prevent as far as possible the spread of the disease into the country. But as cases of choleraic affection have widely different degrees of severity, it is possible that some such cases, slightly affected, will, notwithstanding the vigilance of local authorities, be landed without particular notice in English sea-board towns, whence they may advance to other, and perhaps inland, towns.

2. Former experience of cholera in England justifies the belief that the presence of imported cases of the disease at various spots in the country will not be capable of causing much injury to the population, if the places receiving the infection have had the advan-

tage of proper sanitary administration; and, in order that all local populations may make their self-defence as effective as they can, it will be well for them to have regard to the present state of knowledge concerning the mode in which epidemics of cholera (at least in this country) are produced.

3. Cholera in England shows itself so little contagious, in the sense in which small-pox and scarlatina are commonly called contagious, that if reasonable care be taken where it is present, there is almost no risk that the disease will spread to persons who nurse and otherwise closely attend upon the sick. But cholera has a certain peculiar infectiveness of its own, which, *where local conditions assist*, can operate with terrible force, and at considerable distances from the sick. It is characteristic of cholera (and as much so of the slight cases where diarrhoea is the only symptom as of the disease in its more developed and alarming forms) that *all matters which the patient discharges from his stomach and bowels are, or can become, infective*. Probably, under ordinary circumstances, the patient has no power of infecting other persons except by means of these discharges; nor any power of infecting even by them except in so far as particles of them are enabled to taint the food, water, or air, which people consume. Thus, when a case of cholera is imported into any place, the disease is not likely to spread, unless in proportion as it finds, locally open to it, certain facilities for spreading by *indirect infection*.

4. In order to rightly appreciate what these facilities must be, the following considerations have to be borne in mind:—*first*, that any choleraic discharge, cast without previous thorough disinfection into any cesspool or drain, or other depository or conduit of filth, has a faculty of infecting the excremental matters with which it there mingles, and probably, more or less, the effluvia which those matters evolve; *secondly*, that the infective power of choleraic discharges attaches

\* This General Memorandum drawn up by Sir George Buchanan, F.R.S., late Senior Medical Officer, Local Government Board, and issued by order of the Board on the last occasion of a threatened epidemic of cholera in England, will be found opportune at the present time.

to whatever bedding, clothing, towels, and like things, have been imbued with them, and renders these things, if not thoroughly disinfected, as capable of spreading the diseases in places to which they are sent (for washing or other purposes) as, in like circumstances, the patient himself would be; *thirdly*, that if, by leakage or soakage from cesspools or drains, or through reckless casting out of slops and wash-water, any taint (however small) of the infective material gets access to wells or other sources of drinking water, it imparts to enormous volumes of water the power of propagating the disease. When due regard is had to these possibilities of indirect infection, there will be no difficulty in understanding that even a single case of cholera, perhaps of the slightest degree, and perhaps quite unsuspected in its neighbourhood, may, *if local circumstances co-operate*, exert a terribly infective power on considerable masses of population.

5. The dangers which have to be guarded against as favouring the spread of cholera-infection are, particularly, two. First and above all, there is the danger of WATER-SUPPLIES which are in any (even the slightest) degree tainted by house refuse or other kinds of filth; as where there is outflow leakage, or filtration, from sewers, house-drains, privies, cesspools, foul ditches, or the like, into springs, streams, wells, or reservoirs from which the supply of water is drawn, or into the soil in which the wells are situate; a danger which may exist on a small scale (but perhaps, often repeated in the same district) at the pump or dip-well of a private house, or, on a large or even vast scale, in the source of public waterworks. And, secondly, there is the danger of breathing AIR which is foul with effluvia from the same sorts of impurity.

6. Information as to the high degree in which those two dangers affect the public health in ordinary times, and as to the special importance which attaches to them at times when any

diarrhoeal infection is likely to be introduced, has now for so many years been before the public, that the improved systems of refuse-removal and water-supply by which those dangers are permanently obviated for large populations, and also the minor structural improvements by which separate households are secured against them, ought long ago to have come into universal use.

So far, however, as this wiser course has not yet been adopted in any Sanitary District, security must, as far as practicable, be sought in measures of a temporary and palliative kind.

(a) Immediate and searching examination of sources of water supply should be made in all cases where the source is in any degree open to the suspicion of impurity; and the water from both private and public sources should be examined. Where pollution is discovered, everything practicable should be done to prevent the pollution from continuing, or, if this object cannot be obtained, to prevent the water from being drunk. Cisterns should be cleaned, and any connexion of waste-pipes with drains should be severed.

(b) Simultaneously, there should be immediate thorough removal of every sort of house refuse and other filth which has accumulated in neglected places; future accumulations of the same sort should be prevented; attention should be given to all defects of house-drains and sinks through which offensive smells are let into houses; thorough washing and lime washing of uncleanly premises, especially of such as are densely occupied, should be practised again and again.

7. It may fairly be believed that, in considerable parts of the country, conditions favourable to the spread of cholera are now less abundant than at any former time, and in this connexion, the gratifying fact deserves to be recorded that during recent years enteric fever, the disease which in its methods of extension bears the nearest resemblance to cholera, has continuously



and notably declined in England. But it is certain that in many places such conditions are present as would, if cholera were introduced, assist in the spread of that disease. It is to be hoped that in all these cases, the local sanitary authorities will at once do everything that can be done to put their districts in a wholesome state. Measures of cleanliness, taken beforehand, are of far more importance for the protection of a district against cholera than removal or disinfection of filth after the disease has actually made its appearance.

8. It is important for the public very distinctly to remember that pains taken and costs incurred for the purposes to which this Memorandum refers cannot in any event be regarded as wasted. The local conditions which would enable cholera, if imported, to spread its infection in this country, are conditions which, day by day, in the absence of cholera, create and spread other diseases; diseases, which, as being never absent from the country, are, in the long run, far more destructive than cholera; and the sanitary improvements which would justify a sense of security against any apprehended importation of cholera, would, to their extent, though cholera should never re-appear in England, give amply remunerative results in the prevention of those other diseases.

## THE EFFECT OF REDUCED WORKING HOURS IN FACTORIES.

By HOLT S. HALLETT, C.E.

It has been proved by actual, frequent, and sustained experiments in the United Kingdom, the Continent, and America, and elsewhere that, for both manual labour and labour at a machine, there exists a reasonable limit of hours of labour, with which the maximum effective power of the worker generally corresponds, and that it is senseless, as well as cruel, to work a person beyond these ascertainable limits.

I will first deal with evidence given before the last Factory and Workshops' Commission—that of 1875—held in this country, as to the Birmingham industries, which include nearly every process of manufacture outside the textile fabrics. Mr. Arthur Chamberlain, of the great firm of gas-fitters and brass-founders, in answer to the question, "Is there any trade in Birmingham that works more than 60 hours per week?" replied, "I should think certainly not; I should think that no manufacturer in his senses would hope to get any advantage from working more than 60 hours." Sir Joshua Mason, in his letter to the President of the Commission, declared, "The hands under the Act work 50 hours per week (from 8 to 6). I have had the carrying out of the Act in these works since its application, and can testify that the hands earn as much money, and that there is as much work done as under the old system of 59 hours."

Mr. Hopkins, wrought hollow-ware manufacturer and tinplate-worker and japanner, in reply to the question, "Do the women work only from 8 to 5?" said, "Yes, only from 8 to 5, and I think they do as much work up to 5 as they used to do up to 6." Even more telling evidence was given against the system of overwork by Mr. John S. Manton, a button manufacturer, who stated that, after reducing the working time one hour a day, his workpeople earned nearly one-seventh more by piece-work in the reduced hours. He told the Commissioners that he worked his hands only 48 hours and 10 minutes a week, summer and winter, and said: "We have no overwork. We have found by long experience that overwork does not pay. Increased hours cause listlessness and loss of power, and, therefore, we have abandoned them." So much had this belief grown in the Birmingham district, even as early as 1875, that Mr. Johnston, the factory inspector for its southern portion, stated in his evidence that "The hours of work in summer are, not uncommonly, 8 to 6, with one hour for dinner

from 1 to 2. This arrangement (9 hours' work a day) is growing in favour with employers, who find they can get as much work done as in longer hours with a saving of steam."

Turning to the textile factories, I find in the Report of the Select Committee in 1816 that the celebrated Robert Owen was the first to give a stalwart blow to the devil's doctrine that "the longer you can work men, women, and children, the more you will get out of them." In his evidence he stated that, on reducing the hours in the New Lanark Cotton Mills from  $11\frac{1}{2}$  to  $10\frac{3}{4}$  per diem no reduction in the product of yarn ensued. He said, "I would recommend about 10 hours' actual employment, or, at the most,  $10\frac{1}{2}$  hours. My conviction is that no party would suffer in consequence of it, with reference either to the home or foreign trade."

Such an enlightened idea was long in making its way into the minds of manufacturers. A fresh stroke in the cause was given in 1844, by Mr. Robert Gardner, a cotton spinner at Preston, who, in that year, reduced the running hours of his mill from 12 to 11 a day, and at the end of twelve months reported that he had got a better quality of work and more of it in 11 hours daily than he had previously done in the 12. Three years later, in 1847, the "Ten Hours Bill" was passed for textile factories, but it was not until 1867 that the majority of the industries in this country were brought under legal regulations. The cotton operatives were not long in finding that they turned out at least as much product in the 10 hours' daily labour as they had before done in the 12 hours; they therefore set to agitating for a 9 hours' day, or 54 hours a week, in which they considered they could do as large an amount of piece-work as they did in 60 hours. The manufacturers, however, were fearful of the possible consequences, and the  $56\frac{1}{2}$  hours were agreed to in the Act which was passed in 1874, as a compromise between the manufacturers and the operatives. The opera-

tives soon proved that they could do as much in the reduced hours as they formerly had done. In his evidence before the Gold and Silver Commission, Mr. J. C. Fielden, a Lancashire cotton manufacturer, allowed that in less than twelve months after the passing of the Act "there was not the smallest reduction of produce from that shortening, even with the same machinery."

Turning to the Continent, we find similar proof that a man, whether tied to a machine or not, is limited by his bodily and mental faculties to a certain amount of profitable work in a day, and that it is senseless, as well as cruel, to work him for more than a certain definite number of hours. Only the other day an account of an experiment with reduced hours of labour by a large manufacturer in Belgium appeared in the *Chamber of Commerce Journal*. For three months, as a trial period, this manufacturer reduced his hours from 12 to  $10\frac{1}{2}$  a day, and found that this reduction made no appreciable effect upon the production of his factory. At hand-combing, the workers did the same amount of work in  $10\frac{1}{2}$  hours as formerly in 12; and at machine-combing, which is very fatiguing work for lads, there was a slight increase in production. Many textile factories in Germany have reduced their running hours considerably, owing to strikes, and, according to Mr. Oscar Hall, in no case has there been a consequent decrease in production. The reduction of the running hours in textile factories in Austria in 1889 from 12 to 11 and 10 a day, both increased the quantity and improved the quality of the output. Even the reduction of the hours from 11 to 8 in the glassworks near Dusseldorf, in Germany, after a short time, caused not the slightest falling off in the production.

In February, 1890, in a speech at Chatham, Sir John Gorst pointed to the great waste of labour in employing men "for unreasonable and exhausting hours of labour." He said, "A man who works longer than health and strength allow is wasting his labour, because he is ex-



pandering his energy and toil when that energy and toil cannot render a proper return. It is most remarkable how you find everywhere proofs that long hours of work, so far from increasing production, actually diminish it. I will give you the last two instances I have come across. In the district of Hesse-Nassau, in Germany, ten years ago, the glass factories used to work 14 hours a day; they now work 10 hours, and the production in these glass factories has positively increased by the reduction in the hours of labour. In the great linen factories of Plauen, in Saxony, the people work by piece-work. They used to work 12 hours a day, but recently the hours have been reduced to 10, and the workmen actually earn by their piece-work more than they did before.

## ELEMENTARY PHYSIOLOGY.

### I.—DIGESTION.

THE organs which convert food into nutriment are the mouth, pharynx, gullet, stomach, intestines, and their appendages. The process of digestion consists in the conversion of the food-stuffs eaten into such constituents, for the most part, as can pass by osmosis through the walls of the capillaries, and so into the blood. Once in the blood, the nutritive matters, carried everywhere by the torrent of the circulation, can be absorbed by the tissues through the thin capillary walls, such absorption effecting either the regeneration of the tissues themselves, or, by combination with their oxygen, the production of animal heat.

In order that life be sustained conveniently, it is essential that the body be supplied in definite proportions with the same elements which form its ultimate structure. These are carbon, hydrogen, oxygen, and nitrogen, with certain salts and water.

Food-stuffs are classed as *Proteids*, *Fats*, *Amyloids*, and *Minerals*. Proteids contain, for the most part, the four elements: carbon,

hydrogen, oxygen, and nitrogen. Fats are composed of carbon, hydrogen, and oxygen.

Amyloids also consist of carbon, hydrogen, and oxygen, but they do not contain more hydrogen than will produce water with their oxygen.

Under the head of proteids come the gluten of flour, the casein of milk; syntonin, the chief constituent of muscle or flesh, the albumin of white of egg, and the fibrin of blood.

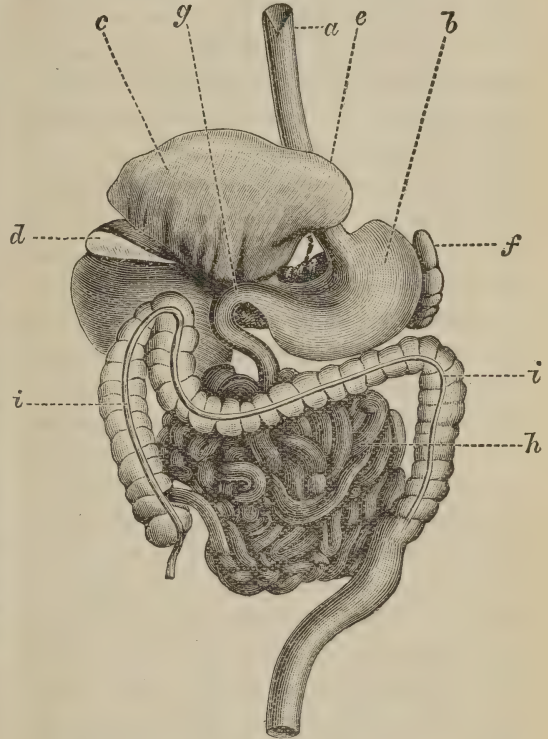
The *fats* include oils, and all vegetable and animal fatty matter. The *amyloids* include starch, sugar, and gum. The *minerals* are water and sundry salts, and to these, strictly, should be added the oxygen secreted by the lungs.

Proteid food would sustain life in the absence of fat and amyloids, but large quantities of it would have to be taken to supply the body with sufficient carbon. Now the taking of proteid food in large enough quantities to supply the body's need of carbon would introduce more nitrogen into the body than it required, and as nitrogenous waste has ultimately to be got rid of by the renal tubules, this excess of labour might be injurious to them. Hence it is advisable to introduce carbon into the body in some less expensive manner. The economy of a judiciously arranged mixed diet is thus apparent.

To understand the process of digestion, it may be convenient to follow the changes which a meal, consisting of beef-steak, potatoes, milk, bread, and salt, would undergo in its progress through the alimentary canal. But the structure of the alimentary apparatus must first be briefly described. The mouth contains the thirty-two teeth, the tongue, and the orifices of the ducts of the salivary glands. These glands secrete an alkaline fluid termed saliva, which contains a ferment, ptyalin. The mouth is bounded above by the hard and soft palates, and behind by the constriction which separates it from the pharynx, a funnel-shaped tube which leads into the œsophagus, or gullet. The

outer coat of the œsophagus is muscular, the inner mucous, the two being bound together by connective tissue. The œsophagus having passed straight through the thorax pierces the diaphragm, and opens into the stomach, the entrance into the latter being guarded by a ring composed of circularly-arranged muscular fibres, which by their contraction can close the orifice. This orifice is termed the cardiac. The stomach is a muscular bag, lying transversely in the abdomen. It is covered externally by a serous membrane, derived from the peritoneum. Beneath this are layers of muscular fibres, then comes a submucous coat of connective tissue, and lastly, the inner coat or mucous lining. The latter is thrown into folds, which disappear to increase the capacity of the stomach when food enters it. It is on the mucous coat that the glands are situated which secrete the gastric juice, an acid fluid which contains the ferment, pepsin. Its acidity is due to the presence of hydrochloric acid. The stomach presents on its upper edge a short concave curvature, known as the lesser curvature, and along its under edge, a long convex, greater curvature. The lesser curvature opens into the small intestine, the entrance being guarded by the pylorus, an arrangement of muscular fibres similar to that at the cardiac orifice. It offers resistance to the passage of undissolved food, and effectually prevents a return flow of the fluid contained in the intestine. Like the stomach, the walls of the small intestine have four coats, an outer serous, or peritoneal, a muscular, a submucous, and a mucous. The latter is gathered into folds, called valvule conniventes, which increase its surface. It also contains a number of small glands, the glands of Lieberkühn, which secrete a fluid, succus entericus, the precise action of which is not known. But the most important of the structures in the mucous coat of the small intestine are the villi, minute finger-like projections of the mucous coat itself, lined with epithelium, and containing an artery, vein, and

capillary network, also the blind end of a lacteal. What are known as solitary closed follicles are also found in the mucous coat. These are spherical masses enclosing bodies resembling white corpuscles, without ameboid movement, and containing a fine network of connected tissue. Sometimes they are found in groups, and are then called Peyer's patches.



THE DIGESTIVE SYSTEM.—*a*, the gullet, or œsophagus; *b*, the stomach; *c*, the liver; *d*, the gall-bladder; *e*, the pancreas; *f*, the spleen; *g*, the duodenum; *h*, the small intestines; *i*, the colon.

The small intestine is divided into three portions—the duodenum, jejunum, and ileum though there is no natural line to mark off these divisions. The first twelve inches is called the duodenum, the succeeding portion, occupying two-thirds of its whole length, the jejunum, and the remaining lower portion, the ileum. The whole length of the small intestine is considerable, but its numerous coils enable it to occupy a comparatively small space. It is bound loosely to the spinal column by a reflection of the



peritoneum. It opens into the large intestine through the ileo-cæcal valve, which effectually prevents a return flow of its contents. The walls of the large intestine consist of four coats: an outer serous or peritoneal, a muscular, a submucous, and a mucous. The latter is studded with glands of Lieberkühn. The large intestine is divided into three portions, the cæcum, colon, and rectum. The cæcum is the blind dilatation beyond the ileo-cæcal valve. Then ascending on the right side as the ascending colon, it crosses the abdomen transversely, and descends on the left side as the descending colon, and terminates in the rectum.

The other organs immediately connected with the digestion are the liver and pancreas, the ducts of which by one common opening pour their contents into the duodenum. The liver is situated on the right side of the body, chiefly under the false ribs. It is a glandular organ weighing about four pounds. It secretes an alkaline fluid called bile, which, when digestion is not going on, is stored up in a receptacle called the gall bladder. The pancreas is a gland lying behind the stomach, about seven inches long, and weighing about four ounces. It secretes the most important of the digestive juices, and alkaline fluid containing a ferment called trypsin.

What takes place when the meal already spoken of is eaten may now be considered. It may be classified as containing: proteids and fats in the beefsteak; in the potatoes, starch in the bread, mainly starch, a little proteid, and salts; in the milk, fats, amyloids, proteids, salts and water.

The action of the teeth, in the first place, breaks the food into small pieces, the salivary glands at the same time pouring their contents upon it, and converting some of the starch into sugar, which is absorbed at once by osmosis into the blood. This conversion of starch into sugar is due to the presence of the ferment ptyalin in the saliva, ferments being bodies capable of producing almost unlimited changes (under given

conditions) in other bodies, without undergoing any change themselves. The rest of the food, rendered moist by the saliva, and converted into a bolus by the tongue, descends into the œsophagus, from whence by continual contraction of the muscular walls of the œsophagus above it, it is finally conveyed to the cardiac orifice, and so enters the stomach. The secretion of the gastric glands immediately becomes active, and they continue to pour their contents on the food so long as it remains in the stomach, the contraction of the muscular walls of the latter at the same time subjecting it to continual movement. This movement, accompanied by the action of the gastric juice, converts the food into a mixture about the consistency of pea-soup, called chyme, some of the proteid matter of which is converted, owing to the presence of the ferment pepsin, into peptone, a form of proteid differing from all others in being readily diffusible through animal membranes. The peptones thus formed are immediately absorbed through the capillary walls, and so enter the gastric veins. The gastric juice has no action at all upon fat or amyloids, in fact the conversion of starch into sugar in the mouth is suspended when the food passes into the stomach.

The chyme having passed through the pylorus, enters the small intestine. In its passage through the duodenum it receives the secretions of the liver and pancreas. The bile has no action on the proteid matter or amyloids, but has a slight power of emulsifying the fats, that is, converting them into a creamy mixture. Its chief action, however, is to neutralise the chyme, and prepare it for the action of the pancreatic juice. The pancreatic juice converts into peptones such proteids as have escaped conversion in the gastric juice, converts the remaining starch into sugar, and emulsifies all the fats. The result of digestion is now called chyle. By the peristaltic contractions of the small intestine, the residue from absorption is conveyed into the large intestine.

The minute globules of fat do not enter the blood like the peptones, sugar, water, or salts by osmosis through the capillary walls. They pass bodily through the walls of the villi into the lacteals, which have already been mentioned as commencing blindly in the villi. The lacteals belong to a close network of vessels found in almost all parts of the body, which contain a clear fluid not unlike blood, *minus* its red corpuscles. The lymphatics, as they are called, originate either in the tissues themselves in a close plexus of lymphatic capillaries, or in irregular spaces lined with epithelium found in interlacing meshes of connective tissue. The lymphatics anastomose freely, but they do not, like the veins, unite to form large trunks. Here and there they enter small, almond-shaped bodies, the lymphatic glands, where they divide and sub-divide, and then reappear as one or two vessels on the opposite side of the gland. Finally, they enter either the thoracic or lymphatic ducts, which open respectively into the left and right subclavian veins, so that their contents ultimately find their way into the general circulation. Though the function of the lymphatics is chiefly to gather up the overflow drawn by the tissues from the capillaries, the lacteals (the lymphatics of the small intestine), import nutritious matter directly into the blood.

Thus all food-stuffs enter the blood either as peptones, sugar, minerals, and water, by osmosis through the capillary walls, except the minute globules of fat, which pass through the lymphatic system before they are received into the general circulation. A certain influence of the nervous system, and a normal state of the part to be nourished, appear essential conditions of nutrition, no less than a right condition of the blood itself.

ATHOL L. MEREDITH.

## HEALTH ASSURANCE.

If there be one principle more than another to distinguish the age in which we live—a practical evidence of an advanced stage of civilisation—it is that of *Assurance*; that is, a provident protection against loss, whether it be contingent on the variable yet immutable laws of Nature, or “the thousand ills that flesh is heir to.”

We know that the hailstorm and the whirlwind are beyond the control of man, that they are partial and uncertain, that they frequently bring destruction to the farmer's hopes, and yet that both are necessary for the healthy operations of Nature.

If phenomena like these can be guarded against, upon a safe and secure basis, how much more easy is it for us to provide against a loss which we can generally foresee, and, by our own reason and will, both modify and postpone, and in many instances totally prevent.

We find that we can protect ourselves against loss through fire, or through the death of our cattle, and by the same process we can turn aside the cold hand of poverty from our families when death may come to ourselves. Indeed, this principle is now fully admitted, and acted upon by the well-to-do, as the surest and safest way of preventing pecuniary loss and family destitution.

If there be no doubt of the soundness of the principle of assurance, how important it is that the working man should take advantage of it to protect himself against the loss of health, the only capital he possesses.

The rich, with means at their command, avail themselves of every means to protect and maintain this greatest of earthly blessings, whilst the poor, not unfrequently without work, which is synonymous with saying that they, suffering from scarcity of food and clothing, are always liable to evil influences which bring in their train disease and death.

The poor man, too, despite of that modern

**COLD IN THE HEAD.**—Professor Ferrier gives the following recipe: Six drachms of bismuth, two drachms of acacia powder, and two grains of hydrochlorate of morphia will form a snuff that will be found very efficacious in checking the complaint. Half of this quantity to be used in twenty-four hours



intelligence of which we hear so much, is now as much the victim of the designing and the ignorant as he was centuries ago, when Government had done but little to protect him; whilst the efforts of working men to carry out the firm principle of assurance amongst themselves are often vain and futile.

One of the most primitive and easily understood was that recorded years ago in a popular magazine, of a number of villagers, paying a shilling each to a common fund for the purpose of assurance against loss to any one of their body whose pig might happen to die before the time had arrived for its conversion into bacon, a casualty which appears to have occurred in a regular average of about one in thirty in that locality.

The same idea has been carried out in various forms of benefit societies, but according to my experience they have generally failed, in consequence of having been held at some inn or beer-shop, or limited to a small district or community, or to some individual trade or calling, age, or sex.

To subdivide the principle of assurance in this way is radically wrong, and to confine it to particular classes is to make an unfair distribution of the average, and this is why they all failed, because their basis was not in accordance with natural laws.

In the matter of health assurance we are in this country in a state of barbarism. Indeed, the intelligent might almost advantageously take a hint from the Emperor of China, who is said to pay his medical advisers a fixed salary, which is stopped from the moment that he falls ill till he gets well again. How far this arrangement is equitable I shall not stop to discuss, as I am totally ignorant of the *cuisine* of his Sublime Majesty, or of the conditions of his household; but of one thing I am quite convinced, and that is, that it is fully as reasonable as the common method of estimating the value a medical practitioner's services by the number of bottles of physic or boxes of pills the patient may have had to swallow.

Now, if we admit the principle of assurance to be sound in the other circumstances which have been referred to, I do not see any difficulty in applying it to a provision for the expense of medical attendance and medicines in the time of illness.

People do not like to look evils in the face, and sickness is one of those which must come at some period or another to us all, as the inevitable heritage of the human race. Even the strongest of us are not exempt, and whenever it comes it always brings more or less trouble and expense.

In this condition, in which all of us are placed, what is easier than to select a medical practitioner, a man in whom one has confidence, and to say, "Doctor, I should like to give you a definite sum yearly, and to have no bills; how much is it to be?" Here an amount can soon be arrived at without any complicated calculations. A mutual understanding can be entered into based on former accounts, and a common-sense and honest view of the particulars of each case, as well as the social and financial position of the family, and thus neither doctor nor patient is troubled with any qualms of conscience about the quantity of bottles, which too often appears to be the legal "*quid pro quo*" of a medical account.

Talent and tact will frequently cut short what might otherwise be a long illness, and a little timely advice would often save a long bill and prevent an illness altogether, but doctors are usually viewed by the public as necessary evils rather than as scientific friends, which, indeed, they are, and would be considered if they could abolish that bugbear of society, an apothecary's bill. But since no means have been found to accomplish this object, I would suggest that it is in the interest of the public, and I hope to show of the profession also, to enter into a mutual compact,—one that is, in fact, reciprocally advantageous.

It cannot be denied that the education of a legally qualified medical practitioner of the

present day involves an outlay of capital and time beyond that required by any other profession, and I am sure that the public will not charge him with selfishness or illiberality. Indeed, it must be admitted that the capital expended on the study of his profession, combined with the intelligence of his preliminary education, would, if invested in any business, give a fair promise of a better return and more success, comfort, and enjoyment than fall to the lot of the majority of medical men.

The French have adopted for many years the system of paying their medical attendant a fixed salary. The payments are made quarterly.

It is no difficult question to ask what is to be had for dinner if a man has a full purse. Neither do people of fortune find any difficulty with their doctor's bill; half of their medical requirements are rather matters of imagination than of necessity, and a good share of the remainder are incidental to a life of ease and indulgence. But there is another class, composed of those who, from narrow means and frugal habits, in the language of the great philosopher, "make to themselves no necessities." Now to such I use the argument of the Life Assurance Offices, and say—Health assurance is the best investment you can make.

But there is a third and very numerous class, I mean the working population. They are so fully occupied in working for their daily bread that they have hardly time to look at the comparatively distant prospect of debility and sickness, and, unwilling to see the evil day, they dare not look it in the face till it comes right on them.

Their partial provision is a benefit club, which has an appointed doctor, but this has some disadvantages, and, whatever may be its advantages as a pecuniary institution, to mix it up with medical contracts is, in reality, wrong. I hold it to be a principle of liberty that the poor man shall spend his hard-earned money where he likes, and this he cannot always do in his benefit club, for the doctor is elected by votes,

and thus, in a club of 100 members, 51 may elect a medical man to attend a minority of 49 who would prefer to have and to pay someone else. This is a fact of everyday experience. In many clubs of this sort there is an unkind and ungenerous spirit prevailing, which requires that a member shall be sick for a whole week before he is entitled to claim pecuniary benefit, and to the doctor is delegated the unthankful task of seeing a man unable to work, and his family in want, because the doctor runs the risk of dismissal from office if he gives a sick certificate.

There is still another class—those who do not belong to any club, and yet are above the condition of the pauper. These are people who struggle on to preserve their little homes and their humble independence, but who, at the first coming of their ailments, are afraid to go to the private house of a surgeon, but carry their shillings to the nearest druggist and ask his advice. Of course he will not turn away ready money, and therefore he gravely advises on a matter, it may be, affecting life and death, and puts in his bill all manner of fees from a penny to a crown. Poor Hodge returns home with his bottle and pills, little dreaming that he has done just the same kind of thing as if he had gone to a wool merchant for a coat, or to a tanner for a pair of boots; in other words, he procures the commercial materials, but he fails to obtain the skill which would turn them to proper account. These observations may be said to apply almost universally to cases of infantile sickness, and every observant medical man of experience must have seen scores—nay, hundreds—of instances of inflammatory diseases of children that have been neglected, that is, attended by chemists till all hope is past, and the doctor is then called in at the last only in time to sign the death certificate.

It may be taken for granted that the bulk of the illnesses of this country are treated by the general practitioners, who constitute the great body of the profession. To them I would say



that, unless we can devise some plan to put more money into poor men's pockets, we must be content to lower our standard of medical charge to this large class of the community or to lose many thousands annually by compelling them to take their money to the druggist. The simple fact is, that we send away from us all the ready money they have it in their power to pay by not consenting to take what they can pay—say, 1s. 6d. a quarter—and then we attend them for nothing afterwards in our pauper contract, or, what is worse, enter their names in our ledger and worry ourselves by keeping imaginary accounts which common-sense forbids us to hope will ever be paid.

What medical man, in general practice for only ten years, has not made hundreds of pounds of bad debts of this kind? Yet still he goes on, hoping that some mythical chance will turn up to pay these bills, which, at the end of a long career in practice, may make all the difference between a period of quiet retirement and a continued struggle for bread. There is one thing that medical practitioners do not, or will not, see; and that is, that the greater proportion of the working man's money for medical advice goes into the hands of the druggist, because they will not condescend to receive what he can pay. A man who earns from fifteen shillings to a pound weekly has not much to spare for medicine, and unless he pays by small instalments—that is by quarterly instalments—he cannot pay at all.

Now, in discussing the matter from this point of view, I am aware that I shall be met by some with the outcry that I am lowering the dignity of the profession, and that I am putting it on a par with chemists and unqualified men, at least as far as money goes.

To this objection I would reply, that the three thousand qualified medical men who attend the patients of the Unions of this country do not get one-half of the payment suggested. The most liberal Unions pay only at the rate of 2s. 6d. per annum for adults, and 8d. per

annum for all under fifteen years of age, so that the average is barely 1s. 6d. Sick clubs, taking advantage of their numbers, frequently screw the doctor down to 2s. 6d. or 3s. a member, although some of the members are in a fair pecuniary position.

My contention, therefore, is that in the case of all the labouring classes it would be satisfactory both to the medical practitioner and to the patients that the latter should agree to pay a certain small sum regularly—that is, 1s. 6d. a quarter for adults and 9d. per quarter for children—and thus the surgeon would reap a greater benefit than by allowing people to run up bills which can never be paid, while habits of self-reliance and health assurance would be promoted amongst the working population. If it were generally made understood that no bill would be permitted to be incurred if these terms were declined, the labouring classes would not be long in seeing that the arrangement would be advantageous to them.

The same principle, proportionate to their means, would be equally applicable to the large class just above the working man, the small tradesman, and also to the class above them.

In some of the suburban districts of London medical practitioners have tried to apportion their fees relatively to the rateable value of the houses of their patients, but this is indefinite and uncertain, and where persons of limited income are concerned, a system of health assurance, by regular quarterly payments proportioned to their means, payable whether in sickness or in health, would, I venture to assert, be found to work well and to the benefit of all concerned.

From what I have already advanced, I think it will be generally allowed that the principles of health assurance are applicable to a very important section of our social system, and capable of development to the same extent as life assurance.

In a rudimentary form, health assurance has existed for many years amongst the work-

ing classes, with whom it has become popular, though its benefits have been to a very considerable degree nullified by bad management and incomplete calculation, or rather, often by no calculation at all.

If we bring to its consideration the same amount of knowledge and financial experience which has made life assurance one of the most reliable and permanent of our institutions, there is no reason why health assurance should not be established and developed into a system equally, if not more, beneficial to us as a people and as a nation.

We know we must die, and we endeavour to provide against the consequences by life assurance. We know also, that in a certain average, illness will come to us some time or other, though in what form we cannot say; yet its recurrence and duration are satisfactorily established by vital statistics, upon a basis as reliable as that which determines the duration of life, and constitutes the foundation of the now national institution of life assurance.

Independently of this, health assurance appeals to us, every day of our existence, to avoid that which may induce disease, and tells us that for ourselves we may do much, individually and personally, to avert, prevent, or cut short many of the ailments to which we may be subject, and so be able to reduce the average of illness to a very great extent.

Not only this, but an office established for health assurance, on a broad and extensive basis, would be a grand and intelligent medium for sowing broadcast, as it were, sound and reliable knowledge on all that pertains to health at every age, and this would indirectly become a very important element in hygienic education as well as in public prosperity.

If we look at the question from the narrowest point of view, namely, as regards one's immediate wants and requirements, and ask what benefit health assurance will afford, we shall soon perceive its advantages; for all of the arguments in favour of life assurance (of which

it is, in reality, a part) apply here with as much, if not greater, force. To this limited point of view I will confine myself for a moment. It is well known that throughout the country there are what are called benefit clubs,—Foresters, Odd Fellows, Druids, Templars, and various other associations, temperate and, sometimes, intemperate,—all having one common object in their organisation, namely, a provision during sickness, with or without medical attendance. The terms and conditions under which they are governed seem to have been settled by some sort of "rule of thumb," that is, without any rational basis or sound commercial understanding, and the result has been that they have often failed—morally, physically, and financially.

As far as we can judge of many of these associations, their affairs appear to be conducted expensively and carelessly; yet, although some of them are reputed insolvent, their natural social adhesiveness has been such that they have always paid their sick relief, and they still flourish, notwithstanding their drawbacks.

We do not seek this position, however, but should endeavour to avoid it; and I believe that health assurance may be successfully introduced upon an extensive scale, which would confer a vast benefit on all grades of society, and at the same time be safe, beneficent, and just. To the working and middle classes this is so self-evident that it must be a matter of astonishment that it has not more fully engaged the attention of the financial or commercial world.

To demonstrate how this end may be effected, I will take the scale of one of these large benefit societies, merely for the sake of argument, which appears to run thus:—A fortnightly contribution of 10d., which for our purpose I will reckon as a guinea a year, entitles the subscribing member to 12s. a week during sickness, and £10 to be paid to his representatives at his death. For our purpose, also, I will assume that 10s. per week is about half the amount of a working man's weekly income, and, applying this rule to higher



grades, it is simply a question of figures to prove that, if a guinea a year will secure the benefits which have been mentioned, by the same rule ten guineas a year will secure £5 per week in sickness, and £100 to the representatives of the assured at his death. I repeat, I only use those figures as a form of argument. Any modifications of them are not matters presenting any difficulty.

The offices which, since the introduction of railways, have infringed the border of health assurance by making provision against accidents, have most of them been highly successful, as shown by their annual reports and the dividends which they pay.

Vital statistics have given us such definite and valuable knowledge of human life at all ages, and in all social conditions, that we are able safely to determine the average frequency and deviation of almost every disease, and as the "chapter of accidents" has been already summed up by the insurance offices just alluded to, there remains only to elaborate and determine the different social conditions, and to apply to them a scale based upon the strictest principles of equity and safety.

To the general medical practitioner health assurance would be doubly beneficial. It would secure to him a reasonable, satisfactory, and certain remuneration for his professional services, and would supply him with pecuniary assistance when sickness overtook him in his turn.

To other members of the community, when laid up by accident or illness of any kind, it would be in reality an "ark of safety"; and when once the benefits of health assurance had been brought seriously before them, they would wonder why it had not been generally adopted sooner.

Therefore, if the principle be sound, any modification of it is easy, and the conditions of it may be so modified as to make the institution satisfactory and equitable to the doctor, the patient, and the public at large.

I will not attempt here to work out rules and conditions which demand care, reflection, and experience, but it would appear to me such an important matter that thorough consideration of the subject is desirable. The more the question of health insurance is discussed and brought before the public, the greater will be the public benefit. The science of public health will become popular, and the people will begin to think, as well as to realise the fact, that they are personally and individually a part of it.

The idea that a bottle of physic will compensate for the want of fresh air, or of soap and water, is an utter delusion; and to suppose that the casual visit of a doctor can in some mysterious way nullify the noxious effects of persistent emanations from a sink or a dust-heap, is a species of social insanity.

Health assurance, intelligently and consistently elaborated, will bring sound knowledge of the principles of hygiene into every household, to the immense saving of life and the improvement of the sanitary, social, and moral condition of the community. M.D.

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### THE WIMBORNE CENTENARIAN, With Some Remarks on Total Abstinence.

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By Dr. A. J. H. CRESPI (Wimborne), formerly  
Editor of the *Sanitary Review*.

My readers will remember that the year before last I wrote for this periodical a little paper on a most interesting person—Mary Adams, of Wimborne. She had for many years been an abstainer, and she had an unconquerable dislike to medical men. She passed through the last winter and spring of her life comfortably, but in the early summer of 1891 she was noticed to be weaker and to be gradually failing, and on Thursday, July 23rd, she passed away, being then in the hundred and second year of her age. She seems to have had little pain, and to have felt that the end was at hand—at least some of

her dying words would bear this construction, though one can never be perfectly sure that when dying people talk of their approaching decease, they fully mean what they say.

She took, as far as I could ascertain, no medicine, her dislike of doctors continuing to the last, and, according to her daughter, Mrs. Reeks, she was perpetually haunted by the ridiculous dread that alcohol would be administered to her by the doctor in attendance; she could smell alcohol in however small amount it might be present, and she resolutely refused to touch it or anything containing it; indeed, her objection to medicine is said to have been entirely due to her fear that it would contain alcohol. Well, poor old soul, she is gone, and though I am not sure that her life was particularly useful and honourable, it was interesting, and adds one to the many instances in which life has been protracted to a very advanced age without the use of alcohol.

That perplexing and hotly-debated question—Is alcohol useful to the aged?—cropped up again last year in the shape of some most learned and exhaustive articles from the pens of eminent sanitary authorities and physicians of European reputation, and furnished a text for many brilliant letters in the London press. The matter is still unsettled, that is to say that we still find ourselves without any large array of statistics which will put it to rest. Of course, in my opinion, and according to my long experience as a medical practitioner and an observer of English manners and customs, alcohol is *not necessary* to the aged. I believe that it does not do them any good, does not add to their enjoyment of life, and does not make them more likely to live on; but I cannot prove my contention, because we have not sufficient facts at our command. Every aged person who lives in comfort to the age of ninety and upwards, and does not take alcohol, is cited by abstainers as an instance of the supreme value of total abstinence, while the moderate drinker, who can point to other old

people who have regularly taken their small allowance, triumphantly asserts that the latter are cases proving the crowning importance of alcohol.

The minutest inquiry, however, fails to give the undoubted preference to either side, and there cannot be the smallest doubt that while the abstainer cannot establish his position by means of a formidable and unanswerable array of figures, not one whit more can the moderate drinker show that alcohol is necessary to the aged. In short, we have to suspend judgment at present, believing that, on the whole, the balance leans to the side of the teetotalers.

We need statistics drawn from a wide field and giving us the facts relating to some thousands of aged abstainers and non-abstainers. Such figures we do not possess, and we do not seem likely to have them. All this may be conceded without in the smallest degree trenching upon those matters which we may regard as finally settled—namely, that the smallest excess in the use of alcohol, although it may not affect *all* the persons who indulge, makes its influence felt to a most marked degree when considerable groups are compared—that is, that a score of free drinkers, who do not appear to suffer from their excesses, may, by a careful system of selection, be pointed out by a person with a large circle of friends; but when a hundred free drinkers are taken at random, and a hundred abstainers, the advantages possessed by the latter—physiologically, economically and morally—are overwhelmingly great.

But we abstainers are not disposed to admit that our cause hinges in the smallest measure on the fact that some moderate drinkers never indulge to excess, and that a few drunkards live to be eighty or ninety. Our argument is that it has never been proved, though often asserted, that alcohol is necessary in health and in disease at any time of life, so that abstinence is absolutely safe. Were it not for drinking we should have none of the fruits of excess, none



of the early deaths through drink, the accidents, crimes, sins, and waste of time and money, which can be traced to drink. The remedy for these evils is not moderation, but total abstinence.

Perhaps I should remind my readers that many intemperate people go on for years apparently little the worse for their excesses. This was the case with a notable London physician recently deceased, who drank as much as two common drunkards. Not long ago, in my hearing, he was jubilant over his excesses and ridiculing total abstinence; three months later he died after intense suffering, and all his medical friends unhesitatingly pronounced him to have been killed by drink. This man wrote ably in defence of temperance, or rather in denunciation of drunkenness, and was accordingly often quoted by teetotal speakers, with many of whom he was in high repute. So much for consistency, and for the wise discrimination of some temperance advocates.

Probably nothing would do the Temperance cause greater good than more often enlisting the aid of distinguished and competent medical abstainers on the platform—men accustomed to observe and reflect; this would be preferable to the somewhat random fashion of handling health statistics and physiological facts now in vogue, which, though it convinces and amuses a teetotal audience, almost always speedily leads to anonymous letters in the press, and often to charges of disingenuousness and unfairness, which are difficult to answer, and do incalculable harm; it is better to understate than to overstate one's facts.

Having got so far I venture to reproduce some facts and figures drawn up by a competent writer from the remarkable facts contained in the well-known book on "Old Age," by Sir George Murray Humphry, the illustrious Professor of Surgery at Cambridge.

"Recently I had the pleasure of reading a work, entitled 'Old Age,' from which I had

the curiosity to compile the undernoted statistics bearing upon the question whether the moderate use of alcohol is good or bad. The writer of the book, Sir George Murray Humphry, M.D., F.R.S., made a most exhaustive study of the subject of old age, and the statistics, which I append, are derived from the consideration of 900 cases of persons who had attained the age of eighty years and upwards, including amongst that number seventy-four centenarians:—

#### PAST HISTORY OF PERSONS FROM 80 TO 90 YEARS.

| No. of Returns | Total abstainers | Per cent. | Moderate Drinkers | Per cent. | Heavy Drinkers | Per cent. |
|----------------|------------------|-----------|-------------------|-----------|----------------|-----------|
| Males ... 298  | 28               | 9·39      | 225               | 75·51     | 45             | 15·10     |
| Females... 232 | 54               | 23·27     | 171               | 73·70     | 7              | 3·03      |
| Total ... 530  | 82               | 15·47     | 396               | 74·72     | 52             | 9·31      |

#### PAST HISTORY OF PERSONS FROM 90 TO 100 YEARS.

| No. of Returns  | Total abstainers | Per cent. | Moderate Drinkers | Per cent. | Heavy Drinkers | Per cent. |
|-----------------|------------------|-----------|-------------------|-----------|----------------|-----------|
| Males ... 67    | 1                | 1·49      | 58                | 86·66     | 8              | 11·95     |
| Females... 92   | 22               | 23·91     | 68                | 73·92     | 2              | 2·17      |
| Total ... 159   | 23               | 14·46     | 126               | 79·25     | 10             | 6·29      |
| Grand Total 689 | 105              | 15·25     | 522               | 75·76     | 62             | 8·99      |

From these figures I draw the following conclusions:—Of 365 males who lived from 80 to 100 years, 29 were total abstainers, or 7·94 per cent.; 53 were heavy drinkers, or 14·52 per cent.; 283 were moderate drinkers, or 77·54 per cent. Of females and males between 80 and 90 and between 90 and 100 years, those who drink alcohol show better results at the greater age, thus:—80 to 90 years, 15·47 per cent. are total abstainers and 84·53 per cent. are non-abstainers; 90 to 100 years, 14·46 per cent. are total abstainers and 85·54 per cent. are non-abstainers. Taking the total results 80 to 100 years, viz., 689 returns, these show 15·25 per cent. are total abstainers and 84·75 per cent. are non-abstainers; so that the chances of living to the age of 80 to 100 are:—men, one total abstainer to 11·594 non-abstainers; women, one total abstainer to 3·264 non-abstainers; men and women, one total abstainer

to 5557 non-abstainers. I do not think anyone will dispute the eminence of the authority from whom these statistics are derived."

The above is interesting and valuable; although the writer's conclusions are not to be taken without some qualification; and much would have to be cleared up as to the original size of the two classes—moderate drunkards and abstainers. Total abstainers are so rare in the richer walks of life that I should not be surprised were it to turn out that the aged total abstainers bear a vastly larger ratio to the teetotalers than do the drinkers to the users of alcohol; in other words, all said and done, an abstainer's chance of living to be 90 may be much greater than the moderate drinker's.

### BRITISH HEALTH RESORTS.\*

#### No. 22.—Strathpeffer Spa, Scotland.

By J. TREGELLES FOX, M.R.C.S., etc.

THIS place is in the county of Ross and Cromarty, near the great double estuary of the Moray and Cromarty Firths, about twenty miles to the West of Inverness, and at the southern foot of Ben Wyvis. It is thus, whilst in the heart of the Highlands, not far from the

sea coast; and is connected by a five-mile branch line with the main Highland Railway, which brings it within easy reach of the South. The passenger from London by an 8 p.m. train crosses the wonderful Forth Bridge in the early morning, breakfasts at Perth, has an enjoyable railway ride over the Grampians to Inverness, and reaches "The Strath" soon after noon.

People visit Strathpeffer for some of the following attractions which it possesses: the waters, the baths, the climate, the scenery of surrounding country, and the facilities it affords for a thorough change, and the enjoyment of various pleasurable occupations. In a course of "Spa treatment," all these elements contribute in various proportions to lift on to a better plane of health the invalid and the exhausted victim of civilisation. A few words explanatory of the main features of the place may assist the readers of *HYGIENE* in making choice of a health or holiday resort.

1. *The Waters*.—The most notable wells at Strathpeffer belong to the classes of the cold Sulphureous and the Chalybeate mineral waters, the scientific value and rational use of both of which are beyond question. There are several sulphureous springs differing in strength and in the proportion of the various accessory salts held in solution, but all containing a considerable quantity of sulphuretted hydrogen gas. The water is not bitter and purgative as that of some other sulphureous Spas, and its active principle, sulphur, is almost all combined in the gaseous form, being therefore highly suitable for baths and for inhalation, as well as for drinking. The "Strong Well" at Strathpeffer is reputed to be the richest in sulphur of any in this country, or on the Continent; and there are several other sources, some yielding water nearly equal or superior to it, others much weaker, enabling the dose to be adjusted to the case. Again the sulphates and carbonates of lime and magnesia and other salts may affect and assist the action of the

\* The object of this series is to direct attention to the merits of different British localities too often overlooked and neglected by persons who are put to much expense, trouble, and loss of time, in visiting Continental places, instead of availing themselves of facilities open to them in their own country. No. 1, Hastings and St. Leonards; No. 2, Cornwall; No. 3, Droitwich and its Brine Baths; No. 4, Swanage; No. 5, Isle of Man; No. 6, Lowestoft; No. 7, Llandrindod Wells; No. 8, Rostrevor (Ireland); No. 9, Cromer and Yarmouth (Norfolk), and Rye and Camber (Sussex); No. 10, Brighton; No. 11, The Undercliffe, (Isle of Wight); No. 12, Bournemouth, by Rev. R. A. Chudleigh; No. 13, The Climate and Surroundings of Bournemouth; No. 14, Yarmouth; No. 15, Dinsdale-on-Tees; No. 16, Ilfracombe; No. 17, Lyme Regis; No. 18, Leamington; No. 19, Malvern; No. 20, Buxton and the Peak; No. 21, The New Forest. Any single number can be had post free by remitting seven stamps to Beaumont and Co., 39, Southampton Street, Strand, London.



different waters. The following table shows the proportion of sulphuretted hydrogen and of alkaline sulphuret contained in the principal springs at present served for drinking, based on an average of the monthly analysis, up to date, conducted by Mr. T. W. Maxwell, Pharmaceutical Chemist and Analyst to the Spa, but for the proportions of the other ingredients reference should be made to the publications on the Spa.\*

| IN IMPERIAL GALLON.                                  | STRONG WELL. | UPPER WELL. | OLD WELL. |
|------------------------------------------------------|--------------|-------------|-----------|
| Sulphuretted Hydrogen Gas,<br>in cubic inches ... .. | 17.38        | 6.54        | 5.17      |
| Ditto in grains ... ..                               | 6.68         | 2.60        | 1.99      |
| Alkaline Sulphurets, as grains<br>of Sulphur ... ..  | 0.24         | 0.26        | 0.20      |

The figures in the above table show a greater proportion of gaseous sulphur than the older analyses. This is in consequence of improvements that have been effected in the conservation of the water whereby the escape of the volatile constituent is lessened. Something yet remains to be done in this direction, but two sources, a new and an old one, have recently been dealt with on the most approved plan, and their water will shortly be served into the glasses of the drinkers without being pumped, and without previous exposure to light or air, but in the same condition as it oozes from the shaly rock.

There is no magic about mineral waters, though many have taken them with a vague idea that they are possessed of some occult curative power. These should know that they imbibe a drug, and that if they do so rashly it may chance to do them harm instead of good. In the case of these waters, we have sulphur, a powerful alternative, freely diluted and perfectly dissolved in a form more readily absorbable than any of its pharmaceutical preparations. This, and the benefit (in suitable

cases) of washing out the system with so much water, are the justification for the use of these springs. Medical men will know in what chronic and perhaps obstinate cases to advise a trial of this remedy; but for the information of the public, generally, we may say that the numerous forms of rheumatism, especially chronic, and of gout, simple and complicated, dyspepsia in its protean manifestations, skin affections, liver derangements, especially the results of free living or tropical residence, and convalescence from influenza and other debilitating illnesses, are the most common ailments which are benefited by drinking these waters. On the other hand, the sulphur waters are unsuitable or only to be used with extreme precautions, in kidney disease, in consumption, and in rheumatic fever, until long after the acute stage is passed.

In these and some other cases the Chalybeate or carbonated iron water of which Strathpeffer possesses a remarkable powerful spring, comes in usefully. Cases of anæmia, simple and organic debility, indigestion, etc., associated with tubercular tendency, or kidney disease contra-indicating the sulphur, often receive great benefit from the tonic and blood-restoring action of this water, which contains iron in perhaps its least obnoxious form, and one also which is not available in ordinary pharmacy. Not unfrequently both the sulphur and iron waters—though quite incompatible, as anyone may observe by mixing them, and noticing the ink-like compound formed—may be suitably used in alternation in the same case. The sulphur acts by pulling down—"decomposing the material of blood corpuscles in large doses," and thus stimulates nature to produce new and more disease-free tissue; but the iron acts in the reverse way by building up—"aiding in the formation of new blood corpuscles" (Ringer). It is needless to insist how important it is, especially in the case of the sulphur treatment, to assist Nature's recuperative processes by other means, such as open-air exercise, suitable

\* See "Strathpeffer Spa, Its Climate and Waters," by Dr. Fortescue Fox (London, H. K. Lewis).

diet, and cheerful occupation. Valuable hints for visitors may be found in the work already referred to.

The sulphur waters are also inhaled as a spray, being then absorbed by the pulmonary mucous membrane, as well as exerting their local action on the throat, bronchial tubes, and air cells of the lungs. The writer has found this method useful in relaxed throats, chronic bronchitis, and asthmatic affections.

2. *Baths*.—Two mineral baths are special to Strathpeffer—the sulphur bath and the peat or moor bath. In addition to these, its local advantages as a watering-place have been developed by the addition of douche baths on a liberal scale and with all the latest methods, and also by the provision of pine baths, hot packing, etc.

Some of these are prescribed for their medicinal effects, as the sulphur baths, in which the gaseous constituent can be absorbed by the skin, thus substituting or supplementing the drinking of the water. Others, as the douche baths, are used for their thermal and mechanical effects, the pressure of the water and its temperature (alternating or continuous) having a marked effect on swellings and congestions in different parts of the body—joints, glands, spine, etc., as the case may be. Others, again, as the pine and peat baths, contain substances which act on the skin, stimulating its vessels and soothing its nerves, and have also thermal effects. Whether these also act medicinally by the absorption of some of their chemical constituents is doubtful.

In addition to the baths, massage in its various forms and the application of electricity are to be had at Strathpeffer.

3. *Climate*.—The climate of Strathpeffer, as determined by several years of meteorological observations,\* may be described as “temperate and fairly equable, combining the advantages of marine and mountain situation at the same time

that it is to a large extent free from the drawbacks that accompany a situation too exclusively of one kind or the other. The summers are decidedly cooler than in the south of England, but they are bright, breezy, and comparatively dry. The long days invite to an open-air life and vigorous exercise, which can be enjoyed without the enervating effects of the heat that is found so trying in many parts of England and on the Continent. There is also the advantage of a pure ozoniferous air coming over sea or mountain and taking up the aroma of pinewood and heather. . . . The winters are a little colder than in London, but their nights at least are often warmer; moreover the days, though short, are not spoiled by the fogs and mists met with so often in the south, and the rain clouds have a knack of clearing off readily, so that frequent spells of bright sunshine, such as are hardly known near London, make walking a delight even when the ground is carpeted with crisp snow.”

From a practical point of view we may recommend the more delicate health-seekers to be careful to choose the summer months for their visit. Those who are able to stand a little exposure will find the cooler times of spring and autumn often very pleasant at Strathpeffer, especially if from any cause the crush of the season is to be avoided. There is often some very bright attractive weather in April and May, and October is a fine month, with its clear skies and rich autumnal tints and a temperature on the average equal to that of May. At these times also the waters contain nearly their full winter charge of gas, which gets less in the warm season. Persons requiring several months of rest and change in a bracing place, as those suffering from nervous breakdown or from incipient phthisis, might come any time, and such cases have been benefited by wintering at Strathpeffer.\*

\* See chapter on Climate in “Strathpeffer Spa.”

\* See remarks on “Strathpeffer as a Winter Resort,” in work previously quoted.



In speaking of climate a note of warning may also be sounded by recalling the observation that in Britain there is more weather to be met with than climate to be enjoyed! If any of the readers of *HYGIENE* go to this place or that, trusting to meet with so much sunshine, warmth, or dryness as determined by the average of meteorological records in that place, he may chance to find them falsified in his own experience, and will, perhaps in his vexation unjustly attribute to the place a climate as disagreeable as the weather which happens to prevail at the time. This risk must be taken more or less by every tourist and the prudent will be provided with clothing suitable for changes of weather, secure warm and healthy lodgings, and, we may add, maintain a cheerful temper. Thus forearmed they may defy disappointment.

4. The *General Attractions* of Strathpeffer are such as grow upon acquaintance, rendering it the favourite resort of many of those who have once "listened to the gentle murmuring of the Peffery," its tutelary trout-frequented stream. Many tourists take delight in the sport the neighbourhood affords, stalking the noble red deer, shooting grouse and water fowl, partridges, pheasants, and rabbits, fishing for salmon, pike, and trout. Lovers of scenery and the picturesque can feast their eyes or practise their artistic talent or photographic skill on the many varieties of natural beauty—the fertile valleys amid pine-planted hills in which the village nestles, the lochs and moorlands around, the deep ravines and rock-bound cascades of the mountain torrents, and the wild uplands and noble mountains beyond. Naturalists count the species of wild-fowl, sea-bird and bird of prey to be seen o'er the reedy bogs, in the grand glens and on the rocky crags; or collect the profusion of wild flowers—many rare and alpine species being native in this region. Historical and geological interest attaches to the country of the Mackenzies and the land of

Hugh Miller, whilst the pleasure-seeker may find recreation in the walks and drives and mountaineering or sporting excursions, in bowls, tennis, or golf, or in the numerous human interests which gatherings round wells have furnished since the time of the patriarchs, from local chit-chat to political news. Concerts and lectures are frequently held during the season, whilst three churches endeavour to meet the spiritual needs of the visitors.

Socially, the place has given promise of bright prosperity and happy helpfulness, which we trust augurs well for its future. First frequented by the simple "Hielan" peasantry coming for the water cure, it became early in this century the resort of large numbers from the surrounding country, and, as means of communication extended, of the well-to-do from more distant parts. Many of those who found benefit from the waters—there were no baths before the middle of this century—showed their gratitude by aiding their poorer fellow sufferers. Several of the visitors built houses and became permanently connected with the place, as well as striving hard to bring it into notice, and to secure improved arrangements, and being many of them sincere people, the simple friendly way in which all classes fraternised round the wells was one of the early characteristics of the settlement. Now that it has grown to a small town, and the mineral waters have been supplemented by the appliances of a modern spa, whilst the denizens of our cities and the wealth of our commerce are spreading over the land season by season, it is surely the duty of our generation, in order worthily to succeed to the traditions of its predecessors, to conserve what is good and to carry forward the banner of progress to greater and better things. The recent rapid development of this health and pleasure resort has successfully met the requirements of the rich, but has unfortunately left the poor unprovided for; and it is therefore to be

desired that a movement which has been set on foot to establish a home for the sick poor coming for the Strathpeffer waters, similar to the Mineral Waters Hospitals to be seen at other spas, may be successful in uniting the residents and visitors in a common beneficent effort.

From the above short account of Strathpeffer it will be learned that the place is scarcely a serious "spa" in the Continental sense, where invalids alone are thought of, and rules and restrictions in regard to the waters, baths, and even diet are laid down in the interests of "the treatment" alone. Ours is a free country, and all may come and please themselves in these matters. At Strathpeffer perhaps as many visitors are holiday-makers and pleasure-seekers as invalids. This is as it should be, for the presence of the tourist and the amusements provided for him lend a brightness and variety which is of great value to the health-seeker away from his home. We think also that it can do the former no harm in the midst of his pleasures to be reminded that others are suffering and his turn may come one day. The mingling of the strong and the weak, the healthy and the invalid, both represented in almost every family, should help us in realising the solidarity of mankind.

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### PUBLIC HEALTH REPORTS.

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ST. LUKE'S, MIDDLESEX (Medical Officer of Health, Dr. G. E. Yarrow).—This old and centrally-situated London parish, occupied by the working classes, presents a singular peculiarity, namely, that the population has decreased steadily during the past twenty years. In 1871, it stood at 54,969; in 1881, it had dropped to 46,849; and last year's census revealed the fact of a further decrease to 42,411. When one hears so much of the diminished population of rural districts, a similar condition of things in the heart of the metropolis, and close to the City

of London, is somewhat perplexing at first sight. It would seem as if the toilers had imitated the merchants and well-to-do traders in the city, and migrated into the country. This, to a certain extent, is probably the case; and it is, indeed, an undoubted fact that many working-class men, availing themselves of the cheap railway facilities for conveyance to and from their daily employment, have removed their families over the borders into Essex, and elsewhere on the Eastern side of London. Sufficient evidence of this fact may be readily adduced in the enormously increased number of inhabitants of West Ham, Walthamstow, Leyton, and Tottenham; and the many crowded workmen's trains on the Great Eastern and North London Railways, every morning and evening, show that the bread-winners of the populous districts situated in the east and north-east metropolitan outskirts travel several miles to their daily work. It is well that such should be the case; in this manner the congested—even now too closely packed—localities find some outlet for their teeming population. Those who can remember St. Luke's many years ago—during the fearful ravages of the cholera epidemics, for instance—will realise the truth of our remarks, and fully appreciate the immense boon conferred by the railway companies running trains at very low fares, for the benefit of working men, whose homes are some miles away from the great hive of industry. Another reason for the decreased population of St. Luke's may be found in the circumstance that in those portions of the parish nearest to the City, huge warehouses swarming with busy people in the day-time, though silent at night as the adjacent historic cemetery of Bunhill Fields, have taken the place of numerous closely-packed tenements. The many blocks of artisans' dwellings, some of these blocks containing nearly forty sets of apartments, and, consequently nearly forty families, which have, of late years, been erected in St. Luke's parish,



fail to bring up its total population to that of 1871, or even of the last decade. The parish of St. Luke's contains 239 acres, giving a ratio of 177·4 inhabitants per acre.

The number of marriages celebrated in St. Luke's presents a low ratio to the population, and in 1891 equalled only half of the average for the whole metropolis. The births in St. Luke's during the same period, after deducting cases of confinement occurring in the City of London Lying-in Hospital, in which the mothers were not previously resident in the parish, amounted to 1,533, giving a rate of 36·14 per 1,000 inhabitants; the birth-rate of London was 31·8 in the corresponding twelve months. The death-rate for 1891 was equal to 30·11 per 1,000, being 9·7 above that of the whole metropolis, and 8·6 above that of the twenty-eight great towns of England and Wales; an alarmingly high average, and, as Dr. Yarrow informs us in his carefully-drawn report, 1·76 per 1,000 above that of 1890—in fact, the highest which he has had to record during his tenure of the medical officership. Dr. Yarrow attributes this excessive death-rate to the influenza epidemic, which not only caused a considerable number of deaths, but contributed indirectly to a heavy mortality from bronchitis and pneumonia, to which 420 out of the 1,277 deaths in 1891 were due; as many as 188 deaths were attributed to phthisis. Small-pox, formerly a frequent and fatal scourge in the poorer districts of London, has not been recorded as a cause of death in St. Luke's for six successive years. Indeed, London has become practically free from small-pox, only 8 deaths having been registered under this heading for the whole metropolis in 1891. Measles caused 46 deaths, whooping cough 20, diphtheria 14, typhoid fever 6, and scarlet fever 5. Of the 1,277 deaths from all causes 537, or 42 per cent., occurred in children under five years of age; 335 persons died over sixty years of age, constituting 26·2 per cent. of the total number.

No less than 91 inquests were held in St. Luke's during the year. The recorded results of the inquiries were: 45 deaths from natural causes; infants suffocated in bed, 19; injuries and shock from burns and scalds, 6; injuries to the heads from falls, 3; deaths from being run over, 3; accidental poisoning, 4; accidental drowning, 1; accidental suffocation by food, 1; debility from premature birth and malnutrition, 2 each; suicides, 4, being 1 each by poison, shooting, hanging, and drowning; and alcoholic poisoning (which might probably have been correctly classified with suicides), 1 death.

The total number of notifications under the provisions of the Infectious Diseases Notification Act was 312, of which 118 of scarlet fever, 36 of diphtheria, and 15 of typhoid fever had reference to cases treated at the Metropolitan Asylums Board Hospital. It would be difficult to estimate the amount of benefit resulting to the community through these prompt notifications putting the sanitary officials on their guard, and thus enabling them to check further extensions of the diseases notified.

Dr. Yarrow, who has, in addition to his medical training, kept his terms at Gray's Inn and been admitted to the Bar, gives a succinct *résumé* of the two principal Sanitary Acts passed in 1891, viz.:—The Factory and Workshop Act, and the Public Health (London) Act, both of which have been published in *HYGIENE*.

Numerous premises have been reported on by Dr. Yarrow during the year, in accordance with the Housing of the Working Classes Act, with the result that the houses forming the subject of inquiry have been either closed, put into habitable condition, or pulled down and other houses built.

The sanitary inspectors' returns of inspections made, and work carried out by order of the Sanitary Committee, cover a period of nine months only, instead of twelve as usual, owing to the recent regulation of the Local Government Board requiring the annual reports to be

made up to December 31st of each year, instead of as previously up to March 25th, the end of the Vestry's financial year. There is more than enough, however, to show the good work that has been done, and to prove the energy of the sanitary inspectors. The number of houses inspected and reported on during the nine months was 1,050. Of these 252 were found to be in fair sanitary condition. But structural and other work were requisite in the others, as evidenced by the long list of operations effected, exceeding 2,000 in all.

Under the Adulteration of Food and Drugs Act (Mr. A. W. Stokes, F.I.C., is the public analyst of St. Luke's), the penalties and costs imposed by the magistrates amounted to £23 12s., which sum was paid to the Vestry; the inspection of foods—meat, fish, fruit, etc.—exposed for sale, must have been efficiently carried out, judging from the number and variety seized and destroyed as unfit for human consumption.

## HOSPITAL SANITATION,

WITH SPECIAL REFERENCE TO TEMPERATURE AND  
PURE AIR.

### I.—TEMPERATURE.

DRAWINGS of architectural elevations are too often calculated to exercise an imposing effect upon the judgment of those who are charged with the responsibility of selection. As in so many other cases, appearance is apt to outweigh utility, the latter being in some instances thrust out of sight entirely, or totally disregarded, until the completed building itself announces its deficiencies for the purpose it was intended to serve. These reflections apply with exceptional force to hospitals. The architect may be expected to appreciate the advantages of plenty of room inside and out, and to provide for it as much as possible; but, when warming and ventilation are brought under his notice he may consider that he has no more to do with them than with the ultimate nursing of the patients.

This is an unfortunate tendency which stands in the way of benefits that might be easily and very cheaply conferred if they were anticipated and provided for in hospital plans. As a rule no such provision is made that can be regarded as adequate. The engineer is thus placed at a disadvantage. Instead of being consulted when the specifications are being considered, as he should be, he is not sent for until obstacles have been placed in his way that greatly increase difficulties that should never exist.

In the matter of temperature, hollow walls will sometimes modify, but they are in conflict with the Metropolitan Building Acts, and are elsewhere only minor considerations, modification being insufficient where complete control is the object to aim at. How to maintain equable temperature is the most important of problems, taken in conjunction with ventilation. According to most experience the problem has hitherto baffled every effort to solve it. The ordinary observer, considering the elementary knowledge that heat has a natural tendency to rise, makes a fire for warming purposes as near the floor as he can. Much of the heat escapes up the chimney; most of the rest is given off at an angle of about 45 degrees. Whoever sits before the fire at a distance of from two to three yards, is so situated that the greater part of the heat passes over his head, while cold air is constantly rushing along the floor towards the fire. Only within roasting distance can a due proportion of the radiation be felt, the back then needing to be protected from the cold draught by an easy chair or other screen.

Meanwhile, the upper part of the interior is overcharged with heat where it is not wanted, the lower part being more or less cold, never approaching comfortable warmth until the upper hot air sufficiently expands downwards, when oppressiveness is complained of, and ventilation at length demanded. Hot air is let out at a high elevation; more cold air enters at the bottom to supply its place; draughts enter,



to the great danger of persons in weak health. Temperature is thus reduced, sometimes fatally; and that is what the uninstructed call ventilation.

The too-widely accepted attempts to remedy the acknowledged absurdities of open fires are closed stoves, or else pipes containing steam or hot water, such pipes being arranged singly, in multiples, or in coils, as the suggestions of situation or *expediency* may determine. Most of the heat is given off, not at an angle of forty-five degrees, but straight upwards, so that the relative heat above and cold below is greater than with an open fire, horizontal radiation being much less or wholly absent. The temperature is liable to be very low in the morning when mostly needed, and desperately oppressive in the evening after several hours of steady operation of the process, when it is intermittent. When it is continuous, efforts to regulate are also apt to run into extremes. Upon the whole, then, such heated surfaces have no advantages over the open fire, and there is the disadvantage that ventilation by the chimney is sacrificed.

Associated with all the means of warming before referred to, perhaps the greatest evil is the false impression made upon the medical attendant as well as upon the critical visitor that there is sufficient or too much warmth. Being erect, his head is in a comparatively high and perhaps oppressive temperature, while all the space below the level of his waist (of course including patients in their beds) will generally be comparatively cool or absolutely cold. Thermometers are likely to be as delusive as are personal impressions. Being placed for convenience of reference at about the level of the eye, a thermometer, of course, records the degree in that position, and is exceedingly misleading. This accounts for the almost universal conflict of evidence between the inmates of almost all public institutions and the officials to whom is entrusted the control of temperature. It is no uncommon thing for

patients to say (when they dare) that it is cold when it is officially pronounced to be too warm. If thermometers were judiciously placed upon the floor they would be valuable checks to common errors.

In some quarters, conflicting remedial theories and systems have been tried by turns in vain, until efforts have been abandoned in despair. But failures are fully accounted for by submission of their authors to the natural tendency of heat to rise. Applied science never submits to natural tendencies, but controls, directs, and makes them subservient. Subject to that dictum theory and practice are successfully combined in truly scientific devices for the warming of interiors. The principles are easy to understand, being susceptible of very brief description. Circumstances may vary to some extent the positions and construction of the requisite appliances, but there is but one broad rule of procedure, and experience is in favour of giving a strong preference to the admission of warm air through suitable orifices at short intervals in *one side-wall only* of the interior to be warmed, which may be assumed to be the inner wall, the admission being at the height of about 7 ft., that is, slightly higher than the heads of the occupants ever reach. Such a position is the initial step of scientific control. The warm air, of course, rises until it arrives at the ceiling, along which it continues to proceed until it reaches the top of the outer wall. By that time it has considerably cooled and is still cooling. Being cooler than the air that supplies the momentum, the stream proceeds slowly down the outer wall, becoming less definite in its identity and course at every foot, its tendency being to mix with and warm the lower part of the room, eventually passing away either through the floor or through orifices near the floor, on the *same side as and below* the orifices by which the warm air is continually entering. Experience proves that such a circuit of warm air diffuses an easily controllable temperature throughout the lower part of

the interior in which it operates, giving an abundance of agreeable warmth where it is most wanted, accompanied by a very notable absence of oppressiveness; while, as the gentle motion of the air at the bottom of the interior is all outwards, draught is impossible.

Such is the latest theoretical mode of proceeding. How to bring it to perfection as against every adverse contingency, and how to ensure proper temperature in summer, can only be fully appreciated by considering the allied subject of scientific ventilation, to be hereafter separately dealt with under the heading of Pure Air.

## Reviews and Notices of Books.

*Des Immersions dans les Sources d'Eau Froide.*

By DR. ARMAND LAURENT. Pp. 75.  
Paris: Baillière et Fils. 1891.

*Our Babies, and How to Take Care of Them.*

By FLORENCE STACPOOLE. Pp. 71. Alexander Gardner, London and Paisley.

*Über die Nothwendigkeit der Reconvallescentenhäuser für Kinder.* (On the Need of Convalescent Homes for Children.) By M. NIGG.

THE immersion of newly-born infants in cold water, usually running streams, is a practice which goes back into remote antiquity. It prevailed especially amongst the Germans, and it was held in high esteem by the Spartans. It originated from different ideas. Amongst the barbarian tribes, it had the character of an expiatory ceremony, and it was supposed to render the infant acceptable to the gods, by the purification of its body. With the Spartans, the object in view was to try the powers of physical resistance, because the State desired to preserve only robust, healthy children. By plunging the newly-born infants into the waters of the river Eurotas such children were initiated into bearing the rigorous test of cold ablutions, while sickly and delicate

children were put out of the way, being killed, in fact, in the training. This "murderous absurdity," as Fonssagrieves has described it, was condemned by some of the oldest known medical writers; amongst them Soranus, in his book on the treatment of children, and afterwards Galen, who, in his treatise on the preservation of health ("De Sanitate Tuendâ"), condemned immersions in cold water in the following terms:—"Let us leave to the Sarmatians, to the Germans, and to the northern nations, the practice of plunging newly-born children into the midst of icy-cold water." Many subsequent writers condemned the custom, but it has survived until the present day in some localities of France.

In connection with the religious aspect of the question, Dr. Laurent refers to the rite of baptism as performed in France. This ceremony occurs in a church, generally a very cold place; and undoubtedly a certain proportion of the mortality amongst infants is traceable to the effects of chill following baptism. One can understand the anxiety of the mother to have recourse as soon as possible to baptism in the remote period when the father exercised the right of life or death over his children; for in the tribes occupying North Germany the father lost this right from the moment that the child had been sprinkled with water by the priest.

We were not prepared, however, in this enlightened age to learn that up to the present time there prevails in some parts of France a superstitious practice of immersing infants in cold water, dangerous to their health and sometimes fatal to the little ones subjected to it. Dr. Laurent states that in the Department of the Lower Seine alone there are no less than fourteen localities where springs exist, to which people resort owing to their supposed sacred character. These are named after various saints, male and female, and at certain periods of the year crowds of persons make pilgrimages to them for the purpose of holding religious fêtes and ceremonies. At such times



processions are formed, with the clergy walking at the head of them, and a solemn benediction of the spring is pronounced by the priests; then the pilgrims set themselves to drink the water, or to bottle it for future special consumption at home, while many of them also wash their faces and dip their infants into the water issuing from the source. No great harm can result to adults from drinking a moderate quantity of cold water, or from ablutions of face or hands; but the case is altered when we come to the wholesale, indiscriminate immersion of mere babies in spring water, commonly very low in temperature. To such a custom we may well apply Fonssagries' expression, *Absurdité meurtrière*.

In infants submitted to the effect of cold water bathing, the temperature of the body falls with extraordinary rapidity; especially in those who are very young or of weakly constitution. The feeble powers of resistance to the action of the cold in the case of infants is evidenced not only by the chilling of the body after the bath or the dipping. Catarrh, laryngitis, bronchitis, roughened skin, and convulsions are often due to the same cause. And no wonder; seeing that exposure to a chilly atmosphere readily produces similar disastrous results.

Dr. Laurent has devoted much time and attention, as well as money, to the practical study and improvement of hygiene, as evidenced by his unsparing efforts in Rouen, where he has established the Normandy Society of Practical Hygiene, a society for the protection of the health of children, and a dispensary for the gratuitous treatment of sick children. His writings and lectures in connection with these institutions have resulted in much good to the community, in addition to setting an excellent example to other localities.

In several respects the hygiene of children has not received the same degree of attention in France that it has in this country. The system of wet-nursing is resorted to by mothers

of the middle and upper classes to an extent fortunately unknown here. As a consequence of this and other social and sanitary faults, infantile mortality in France is greater than in England; and the ratio of increase of the population has diminished of late years, to an extent which threatens to become a source of national weakness. Recent statistics show that out of the 87 departments into which France is divided, only 57 can show any increase in the number of its inhabitants; in 30 the population had actually diminished.

"Our Babies, and How to take Care of Them," is, as described in its secondary title, a series of homely talks to mothers on the management of their infants: comprising the principal parts of six lectures delivered to Mrs. John Elder's classes in domestic economy at Govan, Glasgow, by Miss Florence Stacpoole, who is one of the excellent staff of lecturers connected with the National Health Society.

It contains a mass of useful information on the washing, clothing, feeding, and general care of infants and children. It is a book which every mother should possess and carefully study, if she would have her children grow up healthy, strong and well-formed.

Miss Marianne Nigg's pamphlet is a reprint of a paper read before the International Congress of Hygiene held in London last year, ably advocating the establishment as well as demonstrating the urgent necessity of institutions where children convalescing after illness may be received and taken care of until they have regained both health and strength. It is almost superfluous for us to remark that we are completely of accord with the authoress on this point. Judging from the fact that she describes a convalescent home for poor children, established in 1888 by Mr. and Mrs. Herz-mansky, as the first opened in Austria, we are much in advance of that country, as regards such institutions. Still, if there were many more in England, there would be no lack of suitable cases for them.

## Notes and News.

A CORRECTION: LONDON WATER SUPPLY.—In our note on this subject in the July number, the figures were given wrongly, owing to the accidental omission of three 0's, thus making thousands instead of the proper amounts, millions. The context, and general facts of the water-supply would, however, prevent any one falling into error through the omission.

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HOW TO DEPRIVE VIVISECTION OF ITS HORRORS.—During the progress of the recent election campaign, a candidate worn out with heckling, and confused by the multifarious questions put to him at a meeting where the supporters of his opponent were present in considerable numbers, was suddenly asked, "Are you in favour of vivisection?" "Not until the animals are dead," was the prompt and unexpected reply.

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THE CONSUMPTION OF BEER IN GERMANY, great as it was previously, has taken immense strides during the last few years. In 1886, it amounted to the huge figure of 990,000,000 gallons, but in the last twelve months the total consumption jumped up to 1,144,000,000 gallons; showing an increase in five years of 17 per cent., while the population has increased by only 4 per cent. The German professor who liked his beer so much that he fondly spoke of it as "liquid bread," must have many compatriots of the same way of thinking—and drinking.

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SLEEPLESSNESS.—Mr. George Augustus Sala—"G. A. S."—writing in his pleasant, gossipy style, in *Sala's Journal*, says: "Everybody has his nostrum for insomnia. Dr. Franklin's was to get into another bed. Sir Henry Thompson, I have been told, if he is unable to sleep gets up and paints. Dr. Benjamin W. Richardson prescribes a boiled Portugal onion for supper. But may I be permitted to put in a word in favour of a very old French antidote for insomnia—*le verre de l'eau*, to wit? This is something more than *eau sucrée*, the beverage being flavoured with a few drops of orange-flour water. The effect, to me, has always been inexpressibly soothing and reposeful. Try it."

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HABIT goes a long way in this, as in many other matters. Having for more than thirty years been accustomed to burn a gas-jet in our bedroom at night, it is our practice to cover the eyes with a thin handkerchief. On one occasion we happened to be from home, at a famous hostelry in Shrewsbury, and, retiring to bed at a late hour (having sat up chatting over a pipe with some friendly Salopians), we discovered, just before extinguishing our candle, that we had not brought night-lights in our portmanteau, as usual when travelling. For nearly two hours after getting into bed we turned fitfully from side to

side, a victim to most horrible insomnia. Suddenly the bright idea struck us to cover our eyes with a handkerchief. Within ten minutes' time, we were sleeping as sound as a dog is reputed to do.

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HOW IS IT, by the way, that a dog apparently sleeps so soundly, though it is one of the lightest sleepers amongst animals?

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SLEEPING LIKE A DOG reminds us of an anecdote told of a gentleman who was one of that numerous section of *malades imaginaires* who often constitute themselves into thorough bores when they can get anyone to lend an ear to their tale of woe. The individual in question presented himself in the consulting room of a physician whom he was seeing for the first time. The doctor had just been sent for to attend a most important case; but as the patient was a stranger to him he settled himself courteously in a chair to listen to his story. "I can't make out what is the matter with me, doctor," commenced the patient; "for, although I am sure that I am really ill, I work like a horse, I eat like an ox, and I sleep like a dog." The physician, promptly detecting the bore he had to deal with, and knowing that every minute was precious, in view of the case to which he had been summoned, interposed in his blandest manner, "My dear sir, you have made a mistake in coming to me; you ought to have consulted a veterinary surgeon."

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THE POWER OF IMAGINATION.—An unfortunate asthmatic, compelled to make a hurried journey from home, arrived very late at night at a country inn, where he had never put up before. Completely worn out, he partook of a little refreshment, and was then shown into a huge old-fashioned bedroom, the further portion of which was only dimly illuminated by the miserable candle which he had to undress by. He was not long in throwing off his clothes and slipping into bed. The feeling of being in a strange place, and the rapid mental review of many incidents of his day's journey, with the closeness of the heat, brought on a wakeful, nervous condition which induced an attack of asthma. Gasping for breath, he scarcely knew what to do; to get up and grope about such a large room, in quest of a door or window by which he could admit more air, seemed beyond his powers. All at once he remembered that somewhere at the far end of the room he had noticed, while undressing, a reflection as from glass. This, he concluded, must have been the window, and, seizing a stick which he had placed on a chair by the bedside, he hurled it through the gloom. His conjectures were confirmed, and the clattering on to the floor of pieces of broken glass showed him that he had not only guessed rightly as to the position of the window, but had also succeeded in smashing one of the panes. In his imagination the air of the room became cooler and fresher,



and the paroxysm of difficult breathing soon ceased, the result being that he fell into a refreshing slumber which lasted till morning. Upon his awaking, he was surprised to find the daylight streaming into the room from a direction exactly opposite to that in which, over-night, he imagined the window to be situated. Turning to glance down the room, he discovered that he had smashed a quantity of glass, surely enough, but it had formed, not part of the window, as he had supposed, but the front of a glazed bookcase.

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THE POTATO DISEASE has formed the subject of numerous experiments as to the best means of preventing or checking it, and a report upon these has been drawn up by the Board of Agriculture. Reports from several English counties point to the treatment with sulphate of copper solution (known in France by the name of *Bouillie Bordelaise*) as the most efficacious, but Irish and Scotch experimenters do not speak quite so favourably of this method.

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WRITING on this subject reminds us that a communication from a well-known gardening authority, Dr. Alexander Wallace, appeared in the columns of *HYGIENE* for September, 1890. Dr. Wallace stated, as the result of twenty-five years' experience, the only remedies that he had found to be of any use were:—1. Pulling up the haulm and burning it before the crop had become affected by the disease; this method, he remarks, can be practised on a small scale only. 2. High moulding, so as to keep the rain off the stem and leaves. 3. The use of sulphate of copper dressing, with a view to sterilising the fungoid germ. The best chance of winning a crop of potatoes in good condition, Dr. Wallace says, is to plant in fairly dry soils sorts that ripen early, and can be raised in July and August. He specially instances Myatt's Prolific.

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A REMARKABLE SNAKE has recently been added to the Zoological Society's Gardens. It comes from South Africa, and bears the scientific name of *Dasyteltis*. There is nothing special to note in its appearance, but its anatomical organisation is curious. It lives entirely upon eggs, which it swallows unbroken, owing to the smallness of its teeth. But it has a remarkable unique mechanism for extracting the contents of the eggs. The spines of some of the vertebræ project through the wall of the gullet, and are tipped with enamel, thus constituting teeth. By the aid of these the shell of the egg is broken, and the contents are set free in the œsophagus; all risk of waste is done away with, and the shell is subsequently rejected through the mouth.

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NOT CONFINED TO SPAIN is the agitation got up by interested persons against attempts to legally put down adulteration. In the country just named a Commission has been appointed by the Government

for the purpose of devising means to check the extensive adulteration now practised by Spanish wine growers and dealers; but such powerful influence has been brought to bear upon the Ministry that it is feared, either that the Commission will be dissolved, or that its powers will be restricted to such an extent as to render its labours useless.

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THEY MANAGE SUCH THINGS DIFFERENTLY IN ENGLAND.—When the Government finds itself too closely pressed upon any subject, too important to shelve altogether—for instance, the London water-supply—a Commission is straightway appointed, and the public are led to believe that something great is going to be done. But a Government Commission is usually like the King of France, who marched up a hill, and then—marched down again. Very rarely does anything of a practical nature result from one.

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SHOP HOURS BILL COMMITTEE.—In his evidence given before the Special Committee of the House of Commons, comprising Mr. Stuart Wortley, Sir John Lubbock, Sir Guyer Hunter, Mr. Provand, and other members of Parliament, the Editor of *HYGIENE* pointed out the great necessity which exists for reducing the business hours of shop assistants, and particularly of females, who are specially liable to various diseases through standing for a long time and other circumstances incidental to their occupation. He confirmed completely the evidence which he gave before Sir John Lubbock's Special Committee in 1886, and expressed the belief that many employers would welcome legislation directed to the regulation of shop hours. Indeed, it would be proved eventually to their advantage, for shorter hours would mean greater efficiency of the assistants during the period devoted to business, while it would also tend to diminish the great outlay at present involved by late hours in gas-lighting, etc. This witness also laid great stress upon the fact that a considerable section of the public thoughtlessly do great harm to the cause of early closing by deferring their shopping until unreasonably late hours. In short, shopkeepers require some legislation in the direction of early closing, to protect them against the heedlessness or indifference of many of their customers. Unfortunately, persons employed in hotels, public-houses, and other licensed places, are not brought under the proposed Bill. Yet they need protection as much, if not more than those who are engaged in shops.

EASILY SATISFIED.—In some agricultural parts of the North of England, a distich is in use which serves to show alike the occasionally straitened circumstances of the labourers, and the wonderful resignation with which they bear their privations:—

"They as ha'n't beef must be thankful for bread,  
And give praise to the Lord it's not turnips instead."

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## THE LAW OF LONGEVITY.

By NATHAN ALLEN, M.D., LL.D., formerly  
President American Public Health Association.

THE subject of longevity has always attracted much attention. The art and means of prolonging life were frequently made the themes of discussion, long before the real structure and functions of the most important organs in the human body were discovered. But as the principles of physiology have of late years become better understood, new interest has sprung up in relation to all matters pertaining to health, and the inquiry is very generally raised at the present time: What are the best means of preserving life, and thus securing longevity? Now, may there not be a great general principle or law, grounded in physiology, which may serve as a guide in these matters, and help to illustrate and explain all minor facts or secondary considerations? Is there not some standard or model established by Nature herself, to which we may always appeal, and by which all doubtful questions may be tested? From our knowledge of the laws of nature, as well as of the principles of science generally, we should certainly infer that there must be found in physiology some such general law, or such standard. Years ago, after somewhat extended observation, and no small amount of reflection and reading, I

became convinced that there existed a great general law of population, or increase, as a fundamental principle in physiology, and that this same law of propagation (subject to certain conditions) extended throughout the whole animal and vegetable kingdoms. If such a law of nature does exist, it might be inferred that it would have some connection with the greatest amount of health and longevity.

*Law of Propagation.*—This law may be briefly defined thus:—It is based upon a perfect standard of organisation, or consists in the perfectionism of structure; or, in other words, that every organ of the human body should be perfect in structure, and that each should perform its legitimate functions in harmony with others. Taking this, then, as a standard, we have a great law or principle pervading all organic matter, furnishing a guide by which all deviations from this model, and the manifold changes which follow, may be explained and understood. While this law is subject to certain conditions, such as food, climate, exercise, etc., all these act as secondary agents or factors. They may modify the operation of the law, but they cannot change its nature or general character.

Evidences in proof of such a law may be deduced from physiology itself, from pathology, from the laws of hereditary descent, from the effects of intermarriage of relations, from



facts gathered in the history of different families, and changes in numbers, as applied to distinct classes, races, and nations. But without dwelling upon these points, we maintain that the organisation upon which this law of propagation is based, presents also the only true standard in physiology for the greatest amount of longevity, of health, of physical strength and happiness, as well as of beauty in form and colour.

*Law of Longevity.*—But it is proposed to consider here only the application of this law to longevity. By this term is meant long life—the greatest duration of human life, whether in isolated cases or in larger numbers. Where, then, are these cases found, what is their character, and what are the facts attending them?

In the first place, it is very evident that long life is not dependent alone upon food, nor upon climate, nor upon exercise; neither is it found in any one locality, nor with any one people, nor in any particular station of life; neither where great riches or excessive poverty abound. It is sometimes found in the city, but more generally in the country.

All must admit that some of these conditions are very important, and that good health and long life must depend greatly upon the manner in which the relations between the various parts of the system and these external agents are carried on. But after all, may there not exist a general law in the body itself upon which these depend? If we had perfect standards of organisation around us upon which this law is based, its truth would be more easily demonstrated; but, instead of such, we have only approximations, and these in almost endless variety and form. In order that we may have a clearer and more definite understanding of the foundation of this law, let us carefully examine its physiological conditions. Every animal organisation is complex, is composed of many distinct organs. Each organ has a specific work to do, and in

its normal state must do so much and no more. Now, in the healthiest and most perfectly organised structure, all these separate organs are found not only in a perfectly healthy condition—each one performing its own normal functions—but well balanced and working harmoniously together. In this state the “wear and tear,” or the demands which nature makes to support life and carry on its operations, come upon all these organs alike, each according to its own function, without infringing upon that of any other.

*The Human Body Compared to a Machine.*—In the promotion of health and longevity too much stress cannot be attached to the importance of preserving this harmony or balance of organisation. In some respects the human body may be compared to a perfect machine, made up of many complicated parts. How different the working or running of such a machine from that of one imperfectly constructed and unequally constructed in all its parts; the one seldom needs repair, the other frequently. The one will last, as it were, for an age; the other will become almost useless in a short time.

It is so in reference to the human system. Whenever a certain organ or class of organs becomes relatively too large or too small, causing a want of balance or harmony in their action, there must be in the very nature of the case far greater liability to disease. Accordingly, it is in persons possessing this imperfect ill-balanced organisation that we find not only the greatest amount of sickness, but that which is most obstinate and fatal. How often it happens that some slight derangement or trifling weakness operates as the entering wedge for the most serious diseases! It is at the weak spot caused by inheritance, or developed by exposure, where disease finds its starting point, though all other parts of the system are in a perfectly sound condition; and not unfrequently life is terminated through a single organ, or even some part of it, giving

out when all other organs might have performed their healthy functions for many years.

We dwell upon the importance of this harmony or balance of action in the vital forces, for it is the great secret of good health and long life. It is a cardinal point in the law of longevity, as will appear from a fuller sketch of its foundation.

*Perfect Structure and Harmony of Function.*  
—It is upon this perfect structure or anatomy of the body, combined with the normal action of all its physiological functions, that we base this law of longevity. It is true we have no such perfect standards or models of human organisation now existing, but only approximations towards them. Still, the law may apply to such as we have, just as well as the general law of gravitation or attraction does to the smallest-sized bodies. We can readily conceive of such standards, and how the same law that governs them may be applicable to their representatives of whatever grade or character.

All the pains, the weaknesses, and the diseases of the human body are but the result of deviations from this normal state; and all the means and agencies employed for the preservation of health and life are directed towards restoring this standard. It is well known that there are influences constantly operating to produce changes both in the structure and functions of the system. Some of these influences have their origin internally; some act entirely external to the body; and others operate by what are called laws of heredity. By some of these influences the physical condition is improved and perfected, but by others the deviations from a healthy standard are more and more increased. Probably the most powerful of these forces is that of heredity. This agency constitutes a very important element in the law of longevity. All writers upon this subject place this condition first and foremost—that one of the almost indispensable requisitions for long life is

good healthy stock, or long-lived ancestry.\* For it has been found by universal observation and experience, that the representatives of such stock live the longest, and that very seldom, if ever, are there found persons of great age originating from feeble and short-lived ancestry.

*Law of Heredity.*—Now, what is the secret of this transmitted power that conduces so much to longevity? May there not be some general principle or law involved in hereditary influence which may aid us in explaining the why and wherefore? We know well the effects of such power, but what is the explanation, what is the philosophy involved? Under the law of nature that “like begets like,” and that when the parents are sound and healthy, it is found that their offspring will partake of the same character; and that under favourable circumstances, this may be continued for several generations. Sometimes, there is even an improvement in the stock; but not unfrequently a deterioration, especially after three or four generations.

Now, what is the peculiarity or type of organisation here perpetuated? What are its elements or constituents? What makes it long-lived? Do we not find that it consists in a sound, healthy structure of every part of the body, and that there is a remarkable balance in all the organs, as well as harmony of their functions? We venture the assertion that such will be found the character of this organisation in every instance, and that there are no exceptions to the rule. Does not this, then, afford evidence that there is a general law in nature conducive to longevity, and that this law is based upon that organisation which is most perfect, and all of whose functions act the most harmoniously? Let us apply the rule

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\* In connection with this point, we may refer to the case of longevity recorded in *HYGIENE*, Vol. III., page 216, in the person of one David Jenkins, who reached his 102nd year, and was the great-grandson of Henry Jenkins whose life was longer than even that of “Old Parr.”—Ed. *HYGIENE*.



to such individuals and families reaching a great age as have come under our observation. For many years I have verified the fact in numerous cases and have never found an exception.

There is another point of view whereby this law may be tested. Certain physiological conditions have been laid down by some writers, as sure indications of longevity. These conditions embrace the healthy performance of the functions of all the leading organs of the body, and may be summed up under these heads:—Respiration, Digestion, Circulation, Assimilation, and Secretion. Where all the vital forces connected with each of these departments of physiology are found to operate regularly and vigorously, they are considered to be the sure indications and precursors of longevity. Now what does this imply but soundness of structure and harmony of function? Let any one of these fail in the least degree in the performance of its duty and all suffer. Does not this view of longevity, then, furnish strong evidences in favour of the law which has been set forth in this paper?

*Signs of Longevity.*—There is another class of facts which has an important bearing upon this question. They are what are denominated the physical signs of longevity. There must be a symmetrical development of the whole body. The head must not be too large nor too small. The neck must not be too long nor too slender. The chest must be well developed, but the abdomen must not be too large. The whole body must be well proportioned, not too tall nor too short. No class of organs must be too predominant; or, in other words, the temperaments must be properly mixed or blended; especially the nervous and the sanguine, possessing more of the vital organs, must not be very conspicuous. There are some minor signs, such as the voice, the teeth, the colour of the eyes and the skin, etc.; but when we sum up all the foregoing signs, do they not clearly point to a harmony or balance of all the

organs of the body, and thus confirm the truth of the law of longevity as here advocated?

In all works treating of longevity, great stress is laid upon the influence of climate, food, air, water, exercise, etc. Statistics show that, while the extremes of either heat or cold are not conducive to long life, a moderate climate, in countries where the changes of temperature are neither too great nor too sudden, is decidedly favourable. But even here there must be a strict observance of hygienic laws. In relation to the right kinds of food and drink, pure air, healthy localities, dwellings, employments, etc., however important, they are all secondary agencies, and operate under and in harmony with one great general law.

*(To be Continued.)*

### ON BROMINE AND IODINE AS AËRIAL DISINFECTANTS AND A NEW METHOD OF APPLYING THEM.\*

By GERALD T. MOODY, D.Sc., and F. W. STREATFIELD.

THE question of suitable aërial disinfectants for employment in hospitals and sick rooms is one of very great importance, and has not, perhaps, hitherto received the attention it deserves. Of the various substances employed, bromine has come largely to the front in recent years, and iodine has also been found to exert a considerable disinfecting action, although less than that of bromine, weight for weight.

No small difficulty has, however, been experienced in finding a convenient method of introducing these elements into the atmosphere. Various forms of lamps have been devised for the gradual volatilisation of iodine and its diffusion through the air; and many have sought to effect the same purpose through the medium of the candle or night-light. Whilst working in this direction, and with the endeavour to volati-

\* A paper read at the International Congress of Hygiene.

lise by means of a burning candle certain volatile brominated organic derivatives of the aromatic series, it was discovered by one of the authors of this paper that *free* bromine vapour was evolved in quantity during the combustion of the candle. On extending the experiments to iodine derivatives a similar result was obtained. The authors, therefore, turned their attention to the preparation of a satisfactory bromine and iodine candle.

A modern candle is a very delicate piece of work, being the outcome of many years' experience and of much scientific and technical skill. Next to the proper refining of the fat or wax, the fabrication and chemical treatment of the wick are points of great importance, in order that the candle may burn with a bright flame, and free from cauliflower head. A very small quantity of a foreign body introduced into the substance of the candle causes a very marked effect on its combustion. Many of the disinfectants proposed for distribution by the aid of the candle caused it to burn very indifferently, and sometimes to be extinguished within an hour; or worse still, where it was sought to diffuse the vapour of certain balsamic or phenolic principles, the disinfectant itself underwent combustion, and thus defeated the object in view. In the case where the free halogen was simply mixed with the combustible material of the candle, failure resulted from the escape of part of the halogen during storage, whilst the remainder gradually destroyed the material of the wick. After making numerous experiments the above-mentioned difficulties were overcome, and the authors succeeded in preparing candles and night-lights which do not undergo change in keeping, and by means of which any required quantity of the halogens, bromine and iodine may be evolved with great exactness. This result has been accomplished by incorporating stable haloid organic compounds with the substance of the candle or night-light. Up to the present the most successful halogen compounds used

have been dibromonaphthalene,  $C_{10}H_6Br_2$ , and iodoform,  $CHI_3$ . These substances are perfectly stable at ordinary temperatures, but when burnt under the conditions obtaining in a candle or night-light prepared from pure, well-pressed tallow, give rise to free bromine or iodine vapour respectively.

That the free halogen is evolved is shown by the odour produced; and its presence may be visibly demonstrated by the usual chemical method of holding at a short distance above the flame a piece of unsized paper moistened with a solution of starch and potassium iodide, which is rapidly turned blue.

The liberation of bromine and iodine during combustion may probably be explained on the assumption that the corresponding hydracids are formed in the first instance, and that these suffer decomposition, at the temperature of the flame and in the presence of atmospheric oxygen, into the free halogens and water, in accordance with the equations:—

(a)  $4 HBr + O_2 = 2 H_2O + 2 Br_2$  Hydrogen bromide and oxygen give water and bromine.

(b)  $4 HI + O_2 = 2 H_2O + 2 I_2$  Hydrogen iodide and oxygen give water and iodine.

The authors found that a very useful strength for general purposes is about 6 grains of either halogen compound in a 9-hour night-light; during combustion this will liberate bromine or iodine, the amount of which may be calculated as follows:—

The iodine night-light contains 6 grains of  $CHI_3$ ,— $C, 12 \times 1 = 12$ ;  $H \times 1 = 1$ ;  $I_3, 127 \times 3 = 381$ ; or, 394 grains of iodoform in a night-light will give  $\frac{381 \times 6}{394} = 5.80$  grains of iodine liberated during the nine hours.

The bromine night-light contains 6 grains of  $C_{10}H_6Br_2$ ; as before,— $C_{10}, 12 \times 10 = 120$ ;  $H_6, 1 \times 6 = 6$ ;  $Br_2, 80 \times 2 = 160$ ; or the total 286 grains of dibromonaphthalene yield 160 grains of bromine, and consequently 6 grains of dibromonaphthalene will give 3.35 grains of bromine during nine hours.



By means of the above-given calculation it is easy to bring about the evolution of a stated quantity of either halogen, as during each hour's burning there will be evolved, of free iodine 0·64 grain, of free bromine 0·37 grain. By increasing or diminishing the quantity of the halogen compound mixed with the candle or night-light, any quantity of halogen, within reasonable limits, may be diffused.

The authors believe that the hygienic value of their discovery is very great, since it will make it possible for the vapour of bromine to be used as a household disinfectant in a safe and efficient manner, and where it will be likely to do most good. It is especially for sanitary purposes that the bromine candle or night-light are most likely to be useful, and there is no doubt that they will prove of service for disinfecting closets, lavatories, and wherever sources of infection have to be guarded against. It must be understood that the bromine vapour evolved by the burning candle or night-light does not cause the slightest personal inconvenience in practice, candles containing about 6 grains of bromonaphthalene having been burnt nightly by one of the authors during a period of two years. All the time the candle is burning, the odour of bromine is distinctly perceptible, but by no means disagreeable. Similar remarks apply to the iodine candle or night-light, which besides being effective as a disinfectant and deodorant, has the advantage of possessing a therapeutical value in diseases of the throat, nose and lungs.

### CURIOSITIES OF DIET.

By Dr. A. J. H. CRESPI, Wimborne, formerly  
Editor of the *Sanitary Review*.

How is it that every festive gathering is associated with eating and drinking? Not a tennis party but is enlivened with afternoon tea, or ends with a more substantial meal; not an annual gathering without a banquet attached to it, while certain seasons would be

little without their special dainties; when even the clergy—most abstemious and self-sacrificing of men—celebrate the installation of a dean or the enthronement of a bishop, a breakfast, luncheon, or dinner is *de règle*; when a Cabinet Minister thinks it time to enlighten the country as to the policy of the Government, or the evil designs of its opponents, he is invited to a banquet, and after a long and exhausting process of feeding, is permitted to expound his views. When the doctors, who have been so happily called “Ministers of the Interior,” a far humbler class in public estimation than the clergy and Ministers of State, are arranging for a public gathering, even they, though knowing so much of the evils of over-feeding, cannot get on without a dinner. True, we must eat if we would live, but how many among us live mainly to eat. Nevertheless, I must confess that the pleasure of eating is great, while a liberal table has many uses. For instance, the well-fed man is usually not aggressive, he is no socialist, no firebrand, he does not feel inclined to set his neighbours by the ears; indeed, he prefers the deep recess of an armchair, where he peacefully reclines, digesting his full meal. It has indeed been humorously said that every man is a Radical before dinner, and a Tory after that important meal.

What a subject is eating and drinking! It has furnished me with a good text for a dozen long articles—a dozen, do I say, three or four dozen rather, and writing on it has put many a most useful cheque in my pocket, while prescribing for the sufferers from overeating has brought me in many smaller sums, but given me far more trouble. To write on “Curiosities of Diet” is amusing, and finds ready acceptance with editors, but what is harder than to try to cure the victim of excess? No doubt he is eager to be made well, but none the less determined not to follow his doctor's sage counsel. “Let me eat and keep me well,” he implores, while his perplexed doctor exclaims, “You must not eat if you would be well.”

When two people are diametrically opposed to each other, agreement is impossible, and the physician complains of the self-indulgence and obstinacy of his clients, while the latter console themselves by believing and saying that their doctor is sadly ignorant, and does not understand their case. Few illnesses would last long on bread and water. "Of course not," retorts the sufferer, "such treatment would kill the patient." "Not so," I rejoin; "it expels the disease unceremoniously, and to the manifest advantage of the sufferer."

Nevertheless, a bright dinner-table, resplendent with glass, flowers, a snowy table-cloth and dazzling lights is a fascinating spectacle. The sedate waiters themselves must be elated in their heart of hearts as they look about and see what their skill has accomplished, while, as they bring in the savoury viands, diffusing a delicious aroma around, what can be more tempting? But the endless variety leads you to eat ten times as much as you need; you may not eat much of anything, but you go on eating until you have taken enough for a navy. *Apropos* of the seductive influences of a superb dinner-table, my readers will thank me for giving them one of Christopher North's happiest passages, in which his humour and playfulness are shown to great advantage:—

The sense of satiety is produced in us by three platefuls of hotch-potch; and to the eyes of an ordinary observer, our dinner would seem to be at an end; but no, strictly speaking, it is just going to begin. About an hour ago, did we, standing on the very beautiful bridge of Perth, see that identical salmon with his back fin just visible above the translucent tide, arrowing up the Tay, bold as a bridegroom, and nothing doubting that he should spend his honeymoon among the gravel beds of Kinnuirl or Monlenuarn, or the rocky sofas of the Tummel, or the green marble couches of the Till. What has now become of the sense of satiety? John—the castors! mustard—vinegar—cayenne—catsup—peas and potatoes, with a very little butter—the biscuit called "rusk," and the memory of the hotch-potch is as that of Great Bayblon the Great. Sense of satiety, indeed! We have seen it for a moment existing on the disappearance of the hotch-potch—dying on the appearance of the Tay salmon—once more noticeable as the last plate of the noble fish melted away—ex-

tinguished suddenly by the vision of the venison—again felt for an instant, and but for an instant, for a brace and a half of as fine grouse as ever expanded their voluptuous bosoms to be devoured by hungry love.

Dyspepsia would indeed be rare were the principal meal to consist of one dish, for who but an Irishman could go on devouring even potatoes *ad nauseam*!

What a profusion of vegetables and flowers we enjoy, unequalled by any other country or age! We have drawn on the whole world for them. Asia has given us the cherry, the peach, the French bean, the tarragon, the onion, rhubarb, mint, the mulberry, the citron, the lime, the orange, the chestnut, the pine of Siberia, the pine of Jerusalem, the plane tree of the East, the aloe, the rose of Provence, the mallow rose, the millet, the cypress, and a hundred more. Grain and buckwheat we get from the Levant, and the olive from Africa; while Europe has borrowed from America the potato, the maize, the banana, the loveapple, the strawberry, the medlar, the cacao bean, and a hundred other fruits, plants, and flowers. And yet we might still add to our liberal supplies, or, at any rate, we might use some plants more frequently than we do.

The poorest peasants in Turkey and Syria can in summer obtain abundance of melons and common vegetables, such as melongenes or patlinjans, the blue fruit of the *Solanum Melogena*: these are generally fried with onions; they also have the bania, the fruit of the *Hibiscus esculentus*, usually cooked in ragouts or fried, but too glutinous for most Western European palates. The melongena is now to be got in Covent Garden Market. The peasantry have also Sirok or sorghum, the lablab or dolichos, haricots, lentils, lupins, vetches, and other beans and peas, but potatoes are unknown. They also eat cucumbers and lettuces, and many other fruits and vegetables, cultivated or wild. At least a dozen sorts of edible vegetables are met with almost everywhere. The Arab eats the leaves of several species of Lactuca, Sonchus, and Cardui—the Cardoons



themselves grow at times to an edible size without cultivation—and the roots of *Cepaallium*, a *Scilla*, and an *Ixia*. The men on board the steamers on the Euphrates were, during the Euphrates Exhibition, in the absence of other vegetables, kept in excellent health by wild growths, such as the leaves of the atriplex, rumex, and sinapis. *Scorzonera* and salsifis sprout wild in spring, and are white and delicious on some of the moister plains; and rhubarb, the sort we use for pies, grows rank below the snow line in parts of Kurdistan; in fact, South Western Asia offers a new and splendid field to the explorer, who might greatly extend our already long list of garden vegetables, were he to select hardy varieties and introduce them at home. Asia Minor, in classical times, supplied ancient Rome with many delicious table fruits, and its resources are not exhausted.

Our own hedgerows and ditches would furnish us with many a dish of succulent and useful vegetables. A day or two ago I was admiring the luxuriant growth of nettles adorning the approaches to a familiar Dorset rectory. "You might have many a cheap and wholesome dish," I remarked to the rectoress. "And so we do," she exclaimed with a beaming countenance; "the children have had no meat for four months, and are far better in consequence." Truly, young tender nettles are as delicious as well-boiled spinach and lettuce.

How strange that many of our most familiar vegetables were only, as it were, introduced to our tables yesterday. Not a few which we enjoy, and which seem part and parcel of our existence, are of comparatively modern introduction into England. Shakespeare, although he has two references to potatoes, makes no mention of pineapples, broccoli, cauliflowers, tomatoes, spinach, melons, parsnips, carrots, nectarines, greengages, and raspberries; mulberries he speaks of more than once, and oranges also find frequent notice.

The famous George Dawson of Birming-

ham—strangest compound of wit and wisdom—humour and sadness—devoted to progress, yet not certain what was progress, brilliant preacher of righteousness, yet sometimes uncertain where to find it, friend of humanity, yet half ashamed of the weaknesses of his frail idol, often entranced his congregation with strange discourses—caustic, original, vigorous, but positively startling. He once dealt with the dietetic peculiarities of monarchs, and a more singular sermon never fell from his lips; it was delivered in his own inimitable fashion, and was redeemed from vulgarity by its appropriateness and quaintness. But with the orator's death the music of his words ceases to be heard, and his influence soon passes away, though George Dawson's works are masterpieces of graceful, manly English, and should long keep his memory green.

A Frenchman has been collecting information as to the dishes which the female rulers of European countries prefer. According to this authority, Queen Victoria is especially fond of the Scotch cuisine, her meal—breakfast is probably meant—invariably begins with a plate of oatmeal porridge, so dear to Highlanders; another of her favourite dishes is smoked ham. The Queen of Sweden eats substantial food, consisting chiefly of beef-steak, which always figures at every meal; she is also partial to smoked salmon. The Court of Germany, despite the German names of the dishes, is partial to the French cuisine. The Royal Family of Italy, although in many matters the simplest and most democratic in Europe, always dines off gold plate. The members only drink the wine of their own country, and show preference for the "fritto," a dish composed of the hearts of artichokes and the combs and livers of chicken. The Queen Regent of Spain prefers the Austrian cuisine. She eats roast meat of all kinds with jellies, and gooseberry jelly is one of her favourites. During the earlier part of her life in Spain she only ate one sort of

bread, which was sent her from Vienna; more recently, however, she has eaten the bread of the country.

Cocoa, in spite of its fragrance and cheapness, has had a hard struggle to force its way to its present pre-eminence over every other nutritious beverage; remarkable for its rich aroma, cheap and wholesome to a degree, it has had to fight against stubborn opposition. The reason at one time, no doubt, was the excessive richness of the beverage, which consisted in large measure of a most aromatic, nutritious, but withal indigestible oil, the well-known cacao butter. But all the arts are becoming more perfect, and as soon as a special need is pointed out, someone will certainly meet it. It was found that the oil could be expressed, and two-thirds got rid of, with the result that the beverage was less heavy, more digestible and more palatable. I can distinctly remember when chocolate came to table with a large quantity of rich oil floating on its surface; that is over now, and the improvement has been effected without any admixture of alkalies, starch, sugar or sago, but simply from more scientific treatment.

Though one of the commonest uses of cocoa is as a beverage, this does not exhaust its value; it has medicinal properties, and a teaspoonful of dry cocoa, several times a day, is useful in certain forms of dyspepsia, and can be digested when other food is rejected or causes inconvenience. Again, to the cyclist and the pedestrian, as I have often proved in long and tedious journeys, what is more convenient and sustaining than chocolate, which can be eaten without dismounting or halting, and which gives strength and vigour only to be appreciated by one who, like the present writer, has often given it a trial, and has found it equal, perhaps superior to, biscuits and all other portable and concentrated food.

Chocolate is a true food containing in a small compass all the essentials of a highly nutritious and palatable diet. Cocoa is also

being more frequently used to flavour dishes, and the consumption for this purpose is reaching respectable dimensions. Another familiar use remains—as a bon-bon. Millions of pounds' weight of the finest cocoa are made into crèmes, and other sweetmeats, and are then retailed either in gilt or coloured paper or in boxes that are often beautiful and in some cases are positive works of art. I have seen boxes, which I was told cost seventeen shillings and sixpence unfilled at wholesale prices: many of them had really exquisite engravings upon them.

The leading spirits of the cocoa trade are not resting on their oars, but are determined to develop the business and to offer cocoa in still other forms; for instance, at the museum of the British Medical Association in Birmingham in July, 1890, there was in the case of Cadbury Brothers, cocoa flavoured with ginger, and a more delicious sweetmeat one could not have. This will show that the manufacturers are not satisfied with making Cocoa Essence—the purest form in which this article reaches the public. As for what may be styled familiar chocolate sweetmeats, they are legion, and are flavoured with the most delicate materials—vanilla and almost every kind of fruit have been pressed into the service of the bon-bon manufacturer. Messrs. J. S. Fry and Sons, of Bristol, have been making delicious sweetmeats—almost too tempting for poor human nature. Their Chocolate Vanillas and Fruits de Fantaisie are certainly unsurpassed and unsurpassable. An immense demand for cocoa exists, and is rapidly extending, so that in fourteen years the trade has doubled, that is from 9,000,000 lb. in 1875 to 20,000,000 lb. in 1890, and progress continues. From being the luxury of the rich and a sweetmeat only seen on rare occasions and restricted to special festivals like Christmas, birthdays, and weddings, chocolate is eaten all the year round. But there remains an impression that it is a costly luxury, a mild



one, still a luxury, and that it is greedy to take it often or in large quantity. It is destined to play a still more important part, and to be used far oftener and in larger quantities. The Reports of the Revenue authorities have within the last few days again drawn marked attention to the rapid advance of cocoa, and the probability that it will almost completely displace coffee. The revenue from cocoa is now half as large as from coffee, while it is advancing by leaps and bounds, whereas that from coffee is falling, and the average consumption of coffee is fast diminishing. Let me venture on a prophecy. The consumption of cocoa is now half a pound per head; well, at the present advance, in another fourteen years it will reach a pound a head—no very extravagant amount after all, and children now at school may live to see the average consumption two pounds a head.

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### SCHOOL HYGIENE.

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*“La Santé est le facteur qui fait valoir les zéros de l'Education.”*

WHEN Montaigne wrote the essay from which we quote, and when John Locke—most philosophical of physicians—followed in his footsteps, one hundred years afterwards, education was in a primitive condition. Nor has so much of value been added to it since as many would suppose. The principles enunciated by the former author, and made popular to English readers by the latter, have found a prominent position in the text-books of all who have written upon the subject subsequently, and though Hufeland, Pestalozzi, Fröbel, Dupanloup, Lancaster, and others, down to the authorities of our own time, all express their own special views, yet they all reverently and instinctively bow before their great teacher.

Montaigne laid it down as an axiom that “Those who separate the education of the mind from that of the body, do a great wrong.”

Dupanloup says, “Education is a skilful gardener, who places the plant confided to him in a good soil, sprinkles it with water, surrounds it with favourable conditions, and shelters it with care.”

Fonsangrives tells us of a “blind tenderness,” which makes our children invalids; and a “murderous pride,” which forces them to ride a steeplechase to destruction, by making them Latin scholars at twelve years of age, and accountants at fourteen.

Dr. Rumsey says, “The future man exists in embryo in the schoolroom,” and that he has known boys “of rare parts sicken and die” under the baneful excitement of over-teaching, whilst others have become “hopeless lunatics.”

Locke did not exactly recommend “tunding” as formerly practised so freely at Winchester, but he differed somewhat from Montaigne, in that respect; and, inasmuch as even iron becomes hard by hammering, and soft by heat, so he infers that human nature may readily be made to yield to the genial warmth of kindness.

In truth, the mind of a child is like wax, and will as certainly and quickly take an impression. It is not, however, our purpose to write an essay on education in the abstract, and therefore we will repeat an instructive observation made by Locke, “That if we had been accustomed to go bareheaded from our birth, and to wrap our hands in furs, it would be quite as dangerous to wet the hands, as many people now consider it to be to wet the feet.”

Hufeland was a physician, and the first authority who brought the subject of education into the legitimate domain of Physic. In his day the instructor of youth was called “the high priest of Nature,” which is only a paraphrase of Hippocrates, who says, “*Medicus Naturæ minister et interpres*”—the physician is the minister and interpreter of Nature.

In this utilitarian age of ours, these grand principles are cast aside, and, as regards the great mass of the people, they have been edu-

cated or not, just as may chance to be. It is a matter of common remark that the education of our pauper children is sometimes better than that of some of the guardians; and that, in some of our schools and seminaries with high-sounding names, in fashionable localities, the first object is to make money by putting *extra* charges on any and every possible occasion. Whilst we are writing, we call to mind the case of a lad of twelve years of age, whose education costs his parents £80 a year; and yet the "high priest of Nature," under whose tutelage he is placed, charges sixpence for a matutinal egg at breakfast, or for a small slice of cold meat, which the boy sitting next to this lad feasts upon also—with his eyes.

An authority on the subject sums up the too frequent state of ordinary schools thus:—"Narrow rooms, low, damp, and deprived of sun, sometimes hot and close, saturated with bad odours, or subject to draughts. The seats are too high or too low, the positions dangerous for the lungs, the stomach, the circulation, the spinal column, or the brain." Then, too, the "dazzling reflections of light" (and some of our new and splendid school-rooms admit the light on three sides) injure the eyesight in various ways.

These are the conditions in which many of our children are brought up at schools. The result is far greater illness and mortality amongst children than there should be.

Hufeland insists that "we must not form the mind at the expense of the body," and Fonsangrives tells us that, in his early life, he used to see "fine young men, of twenty, with quiet manner, fresh colour, and honest faces, who had sound health, and did their work steadily and well." "Nowadays," he continues, "they are replaced by children—men of seventeen or eighteen, thin, nervous, pale, and perhaps married, led on by ambition to their destined career. Some drop by the way, a few (thanks to innate vigour) resist these trials, whilst the majority of them arrive at maturity

attenuated, their bodies destroyed by anticipated efforts, and their intellects impaired and incapable through immature mental exertion."

When this degeneration occurs, it is a sad reality, and it is a foregone conclusion that, by weakening the physical condition, the moral force of the character is proportionately destroyed.

The fine and bright flame of intelligence burns only by consuming the body. Though it is non-material in its nature, yet it requires a material aliment, and wears out the organic strength of the body which supplies it. And whilst muscular effort works out its own repairs by giving a better appetite for food, and increasing digestion, on the other hand mental exertion in undue proportion intensifies the evil, depresses the vital functions, and so prevents necessary recuperation.

Professor Velpeau, of Paris, under whom the writer of this article had the pleasure of being a student, enunciated this fact in a few pithy words, which have since passed into an aphorism:—"Once destroy the balance between mental and physical condition; what you gain in intellect you pay in tubercle" (*i.e.*, consumption).

Even the teacher has been aptly compared to a candle which burns itself out in enlightening others, and he (or she) is sometimes a martyr in a better cause than the so-called hero who dies upon a rampart. The time has not yet come when this is accepted as a truism, but come it must; and recent sad cases of suicide by teachers, with numerous, less widely known, instances of physical break-down amongst them, serve to illustrate the force of our argument.

The question of the food of children is a matter of primary consideration in connection with education. Within our knowledge a boiled bullock's head and a few potatoes have been given at one of our suburban schools (the promise of "unlimited diet" is flaunted on its prospectus) as a dinner for twenty boys, and a



dozen small fresh herrings have been called a dinner for the same number of young ladies, whose parents paid very high fees for them. But to regard such diet as a meal, or to call a couple of thin slices of bread-and-butter, and hot water with barely enough tea and sugar to satisfy one's conscience, or copiously diluted milk, of the character described in police reports as "country," by the name of either breakfast or tea, is worse than a farce, and it is an insult to common sense to be asked to suppose it possible that the human frame can be built up of such scanty materials.

The activity of all the processes of life concomitant with youth—circulation, absorption, and respiration—go on at a rapid rate, and the food is transferred into the living body and appropriated, not only in supporting it, but in adding to its size and weight.

How, then, can we expect a satisfactory result from the ordinary diet of such schools as we have referred to? Whatever the principals of many educational establishments may say, or prospectuses may promise, the fact remains—and it is notorious—that when children return home for the holidays, they have a great craving for sugar, and butter, and cake, all rich in elements of heat, and fat-producers, wherewith to balance the equation in their organic structure. How is it that hysterical girls often get well when they come home from school, though the doctors could do nothing with them there? Because after their return they have a diet suited to their physical requirements, as well as unlimited in quantity. We may "tone down" the subject as best we may, to suit our objection to disagreeable truths, but the hard fact will still remain that, in many of our boarding-schools, the system is not so very much in advance of "baby-farming."

In the District Schools, too, what do we often observe? A vast aggregate of human atoms, who are counted by hundreds, possibly a thousand, in one building—and with what result? Speaking from personal observations

we assert that children in such circumstances lose their individuality, and insensibly become mere numerals, like the inmates of a penitentiary. This happens without wish or intention; and as there is a moral and social obliquity so there is also a physical divergence. In evidence of this, witness the outbreaks of ringworm and other skin affections, or of ophthalmia, which are occasionally chronicled in the daily press as occurring in various large District Schools.

The reader will, perhaps, be surprised to learn that the average number of cases of deformity in schools, in various degrees of development, taken generally and promiscuously, has been estimated as high as 40 per cent. amongst girls, and 20 per cent. amongst boys, and that the great majority of cases of spinal deformity are referred as to their origin to the period of scholastic life. Eminent ophthalmic surgeons have remarked that defect of vision, a common result of mismanagement of schools, runs *pari passu* with spinal deformity.

In the great question of education, and of various collateral matters, the Americans are far before us, and before most, if not all, European nations. It is not a little singular that the American desks and seats with backs, for the pupils, are almost identical with those adopted by Joseph Lancaster, when he, tired of the alternative opposition and oppressive patronage which he experienced in this country, emigrated to the United States.

Joseph Lancaster began to keep school in London, in the year 1798, when he was eighteen years old, in a room in his father's house. He purchased some old boards, and fitted up the school-room with his own hands, and thus commenced an institution which, to quote his own words, "drew forth the opposition of the bigot, and the persecution of men eager in the pursuit of popularity, but too idle to earn it."

He had 100 pupils, but being without money to engage teachers, he set one pupil to teach

another, and thus originated his system, which has been copied and modified a hundred ways, although very rarely acknowledged. Subsequently, he had 300 scholars, and eventually as many as 800 boys and 200 girls, and to those who were too poor to pay, he gave education freely.

He discovered that "he could educate three or four children in elementary knowledge for a guinea," a fact which we beg to submit to School Board authorities, referring them to Joseph Lancaster's own work on the subject as our authority. He frequently took his pupils out for a walk, and he mentions that, on one occasion he took "500 pupils out on an excursion in perfect order and peace." Lancaster carried on his school from 1798 to 1804, and then, leaving it to the management of others, he travelled throughout England; but, as he says in his Memoirs, the Committee got into debt, treated him as if he were a "hired servant," and so he finally turned his back on his country. He adopted America as his future home, and was, as far as we can learn, the founder of the admirable system of public instruction now practised in the United States.

Education is, so to speak, the nursing mother who teaches the child its first step out of "a darkness that can be felt"; and also the willing handmaid who converts the child into the man.

When a child takes a dislike to his studies, his conduct and his morals are so closely connected that they suffer alike, and call for serious and immediate consideration. This deterioration may be frequently traced to the hygienic condition of the school.

Three hundred cubic feet of space is the least amount that ought to be allowed to each individual. Children respire oftener than adults, though their lung capacity is less; so that, with regard to this point, they ought to be treated as adults. For instance, a room, 10 feet high, 20 feet long, and 15 feet wide, is barely enough for eight pupils and two

teachers; if the room were 12 feet high, and of the same dimensions, it might be used to contain two more persons. In fact, all rooms used for education should be 12 feet high, at least. Oertel found by experiment that in well-ventilated private houses 10,000 parts of air contain 8 to 10 parts of carbonic acid. But elsewhere the proportion was as follows:—

Hospitals, 14 to 30 parts, in 10,000;

Prisons, 13 to 33;

Barracks, 27 to 53;

Schools, 16 to 94;

And, in the last-named instance, with what results? Is it surprising that on entering a school-room where there are a number of pupils we find that the air is damp and loaded with an unwholesome smell? just the sort of atmosphere, in fact, which Dr. Guillaume has described as "*Miasme scolaire*."

Besides this deterioration, we have dust floating about in large quantities, as we can verify when a sunbeam darts across the room, and the dust of the school-room is as hurtful as that of many manufactories.

In an interesting paper on Headaches in Children, read at the International Medical Congress held in Washington four years ago, Dr. W. H. Day specially pointed out that these affections are very common amongst school children, and quoted in support of this view the statement of Professor Bystroff, who examined more than 7,000 children in schools at St. Petersburg, and found headache in 11·6 per cent. of the whole number. The chief causes of headaches in school children are, according to these two authors, deficient ventilation of the school-rooms, overtaxing the mental energies of the children (more particularly those of delicate build, or who are underfed), and defective vision.

Fröbel, who was born in 1782, was a pupil of Pestalozzi, and a contemporary with Lancaster. He left us the legacy of the Kindergarten.

Some time ago we visited in Paris a Kindergarten school containing sixty children, all



girls, in two classes, from three to eight years old, and it was astonishing to witness how thoroughly happy the little ones appeared in their work. We saw them solve many of the elements of geometry, and prove by describing them that they were acquainted with the nature of curves, angles, planes, and spheres. All this they had learned without the aid of books, but merely in the form of amusing object-lessons. Here the little ones were not kept at one subject more than fifteen minutes, and they had ten minutes relaxation, *i.e.*, play, every hour—a very important hygienic consideration.

Let us hope that matters of such great moment as the diet and physical development of children, and the ventilation and other sanitary arrangements of schools, may not always be considered of less importance than the acquirements of so-called accomplishments, which are seldom brought into requisition in after-life.

W. A.

#### PATENT MEDICINES.\*—No. 14.

##### THE GOLD CURE FOR DRUNKENNESS; FINALE OF THE MATTEI COMMISSION OF INQUIRY.

"Men often swallow falsities for truths."—*Sir Thomas Browne.*

If the learned writer from whom we have taken this quotation (worthy to rank with John Locke as foremost of philosophical physicians) could get an insight into the quackery of the present day, he could find abundant opportunity of verifying his axiom.

Indeed, the field is so rich in illustrative facts

that one feels an *embarras de richesses* in selecting one for the purpose. As we write these lines, and glance at the papers lying upon our library table, we catch sight of a boldly displayed advertisement, printed throughout in capital letters, on the leader page of one of the principal London daily newspapers. "Drunkenness permanently cured in three weeks," says this announcement, "by the double chloride of gold treatment as prepared and given with such marvellous results by G. H. McMichael, M.D., of Niagara Falls, U.S.A., in his various institutes in America." Further on, we are told that at the British Gold Cure Institute, located for the time being in a small street at the West End, dipsomania or hereditary drunkenness is permanently and easily cured. Hereditary drunkenness! This is an ingenious way of helping the drunkard out of his difficulty and disgrace; just as, in the case of gout, no one was ever known to admit that his disease was of his own making—the blame is invariably fixed on a grandfather or some equally convenient ancestor—so we shall have every sot excusing his delinquencies with the remark, "Can't help it, it's (hic!) hereditary, don't you know."

Now this alleged British Gold cure turns out to be what might with greater truth be designated the American Brass humbug. Its home is at Dwight, in Illinois, and one strong reason for its finding its way into this country, apart from John Bull's proverbial gullibility, is that it has been, to use an Americanism, pretty nearly "bust up" in the United States.

Many of our readers may have noticed in small shops in country districts base coins securely fixed to the counter, by way of reminding any utterer of dishonest money who may enter the place that the tradesman is on his guard against trickery and fraud. Following this example, we will just drive a nail into one lie concerning the bichloride of gold treatment. An eminent analyst, who has examined this preparation, reports that it contains neither gold

\* The articles on this subject which appeared in *HYGIENE* for 1891, have been reprinted and published in book form under the title of "Patent *alias* Quack Medicines"; 3rd edition, 128 pages, price 1s., post free for 14 stamps. (Beaumont and Co., Limited, 39, Southampton Street, Strand, London.) During the present year articles have appeared on Beecham's Pills, Warner's Safe Cure, Morrison's Pills, Baillie's Pills, Dixon's Pills, Lee's Pills, a Quack Libel Case, Modern Mysticism and Mattei's Electricities, Nicholson's Patented Artificial Ear Drums, Electric Belts, St. Jacob's Oil, etc.

nor chlorides, but that its composition is as follows:—Water, 61·31 per cent.; sugar, 6 per cent.; a small quantity of lime-salts; and 25·55 per cent. of alcohol. *Neither gold, nor chlorides* of any metal! Who, after this startling revelation, would dare to attempt a contradiction of Sir Thomas Browne's *dictum*, practically applied in this instance, "Men often swallow falsities for truths." But, though the poor dupes of the American Brass curers of drunkenness—always hereditary, be it remembered, according to their veracious statements—get no gold in their physic bottles (the price charged for those which were analysed was nine dollars (36s.) for two bottles, the lowest number which a purchaser could be supplied with), they get, instead of the expected gold, a wholly unexpected ingredient, in the form of alcohol, to the extraordinary extent, considering what the medicine is given for, of considerably more than one-fourth of the entire quantity of fluid; thus making it double the strength of champagne, and equal to that of port or sherry.

If, however, the patient gets no gold, the same cannot be said of the conductors of the Institute. In reply to a gentleman who wrote, asking for the terms upon which the cure would be supplied, the secretary, Mr. Gerald D. Apthorp, informed him (the letter is dated August 9th) that the charge was fifteen guineas for three weeks, with five guineas for each additional week. Fifteen guineas were, really, the lowest price that could be accepted for such a priceless boon; and the continuance of the treatment after three weeks, at the modest figure of five guineas for every seven days, would be dependent on the judgment of the doctor, subject, doubtless, also to some extent to the question whether the patient having swallowed so little gold and so much alcohol in the three weeks' course had any more of the former indispensable in his pocket. "We do not send out medicines, as we find that to be successful," the secretary somewhat vaguely wrote, "patients

must come to the Institute;" where they have to submit to periodical hypodermic injections of narcotic poisons, in addition to quaffing their *golden* grog.

At a recent meeting of the Society for the Study of Inebriety, presided over by Dr. Norman Kerr, who has done much to expose the Gold Cure humbug, the chairman said that an attempt, fortunately frustrated, had been made to float a syndicate to raise £150,000 in this country to purchase the right of using the Gold Cure; £110,000 in hard cash and £40,000 in shares, being all the proposing vendors asked. Such unparalleled philanthropy ought not surely to pass unnoticed.

Some of the rules of the Institute are too interesting to pass unnoticed, too, if we read between the lines. The first two rules refer, we need scarcely observe, to fees and prompt payment, patients being delicately requested "to arrange all financial matters with the Secretary-Treasurer on their arrival." Rule 4 lays down that "the remedy for internal use is compounded to meet individual needs"—can this have reference to the relative proportion of alcohol?—"and loaning or exchanging is not permitted." We could understand that "loaning" would be in brisk requisition if the bottles actually contained—what they are presumed to contain—gold; but what gentleman or lady, except a drunkard, hereditary or otherwise, would dream of "loaning or exchanging" a bottle of liquor? Rule 5 there is little to find fault with, save that it does not go far enough. "Bathing is essential, and patients are required to bathe at least twice each week." Drunkards are commonly more chary of using soap and water externally than they are of using brandy or whisky and water internally; so that there is as much need of advice of this kind as there was in the subject of the following anecdote. A particularly dirty-looking individual, dirty enough to have been a hermit had he lived centuries ago, presented himself at the consulting rooms of a West



End physician, to seek advice concerning a troublesome cutaneous eruption, entirely due to his uncleanly habits. The physician, after a little preliminary conversation, commenced to advise the patient, who, of course, was all attention. "I should recommend you to get forty gallons of boiling hot water into your bed-room when you go home, and to place it in a large tub; next, having divested yourself of your clothes, to immerse your body in the hot water; then, taking a piece of soap in your hands, to rub it well until you have formed a good lather, which you should carefully proceed to apply all over your body, removing it by the aid of the hot water. Afterwards, you should rub the surface of your body with a dry rough towel." "It seems to me," grunted the indignant patient, scarcely able to restrain his rising passion, "that you are telling me to have a bath." "It does appear like it," blandly observed the physician, as he swept the fee with a clinking sound from the table into a small drawer, "and, by-the-bye, I would recommend you to persevere with the prescription."

Rule 7 reads as if it had reference to the alcohol contained in the golden solution: "The physicians earnestly entreat patients to avoid saloons and bar-rooms, and to use only what is prescribed at the office." Why, certainly! If a man could not content himself with a potion as strong as port or sherry, and twice as powerful as champagne, he would be a most unreasonable individual.

At the meeting of the Society to which we have already referred, Dr. Usher, of Melbourne, Australia, described a visit he had made to the Gold Cure Institute at Dwight. The proprietor, "Dr." Keeley, who was very uneasy while conversing with him, told him he had employed "the remedy" twelve years with great success. To Dr. Usher's very natural questions as to the treatment and what prescriptions he used, Keeley replied, "We will not go into that; I know it is all right. If you want to learn anything about it, the

secretary or chemist will tell you." This secretary-chemist turned out to be a sort of page-boy. Dr. Usher was introduced to Dr. Blaine, "the chief of the staff;" he did not tell his audience what "the chief of the staff" was like, but our readers can perhaps arrive at a fairly accurate conclusion when we mention that "the staff" consisted of unsuccessful practitioners." Dr. Usher was taken where three rows of men were being injected in the left arm with five drops each, out of a little porcelain bowl containing a pinkish material—atropine. Many of the patients wore glasses, and they told him that they could not see three or four days after the commencement of the course of treatment, and had become almost blind. They suffered, too, from giddiness. One patient had been at the institution nine weeks, and was afraid to leave because three of his "pals" who had left ten days before had got drunk and had to come back. So much for the permanence of the Gold Cure! Another patient, who really seemed in some respects more intelligent than the rest, candidly imparted the information that an aunt had promised him an annuity if he stayed there two or three months, so that he "wanted to see the time out." Incidentally, Dr. Usher throws an amusing light on the manufacture of testimonials. Three leading physicians from New York, Boston, and Philadelphia, representing three different societies in those cities, had visited the Institute, at various times, remaining half a day or so. Some six weeks afterwards, Keeley (the sly rascal!) issued a number of circulars which set forth these three gentlemen as remarkable instances of successful cure. One of the special features of the Gold Cure Institutes is that they have amongst the members a "Bichloride of Gold Club," including two classes termed, respectively, "graduates" and "undergraduates." Could anything beat this as a specimen of exquisite fooling?

It is too often the practice in England to

severely punish small offenders, while great ones go scot-free. In the daily paper from which the advertisement of the Gold Cure Institute was taken, we noticed a police-court report of a miserable old man who was sent to prison for trying to pass a counterfeit shilling in payment for a scrap of bacon. Decrepit dolt! If, instead of resorting to what may be termed the silver cure for starvation, and tendering a coin deficient in value of silver by a few pence, he had hired apartments in a fashionable quarter and passed off a compound of alcohol, water, and sugar as containing gold, he might have "gone the whole hog" in place of a beggarly bit of bacon, and have made thousands upon thousands of golden sovereigns in a few weeks.

Who is responsible for the inaction of the police, who is to blame for the inertness of the medical corporate bodies, in such gross instances of quackery and imposture as we have exposed, and shall continue to expose, in these columns?

As we prophesied last year, the Commission of Inquiry into the alleged curative properties of Mattei's Electricities has come to grief. The fiasco is complete. Mr. Lawson Tait, disgusted with the obvious efforts of the Matteists to evade a fair trial, retired from the committee at an early stage of the investigation. Dr. Potter held on longer, no doubt equally to the annoyance of the Matteists, who refused all but five of the persons submitted for treatment and observation, though these were only in the incipient stage of cancer. The clinical results of the treatment as resorted to in these five cases were as devoid of success as the remedies themselves were reported in our columns (HYGIENE for December, 1890), by Mr. Stokes, F.C.S., to be devoid of any chemical properties whatever, except those possessed by—*water*.

THE EDITOR.

A DIETETIC DIFFICULTY.—Gentleman, consulting a physician concerning his delicate wife and baby, about to be weaned: "What ought the baby's food to be, doctor?" Doctor: "Nothing but the milk from one cow." Gentleman: "And I believe you said the mother ought to take four or five fresh eggs every day?" Doctor: "Yes." Gentleman: "Well, doctor, should they all be eggs from one hen?"

## HOSPITAL SANITATION,

WITH SPECIAL REFERENCE TO TEMPERATURE AND  
PURE AIR.

### II.—PURE AIR.

THE only reliable mode of ensuring pure air in any interior is by means of ventilation upon scientific principles in contradistinction to primitive modes. Just as uneducated impulse seeks to warm from below and only succeeds in providing warmth above, so has the like impulse sought to ventilate at the top, while leaving the lower and occupied parts of an interior very imperfectly or injuriously acted upon. This impulse to rely upon ventilation at the top is encouraged by the impression, that as the volatile gases always seek to rise, all that is needed is to make openings at the top to let them out. But in almost all interiors, more particularly in hospitals, it is the heavier gases that make the greater mischief, carbonic acid gas being the most familiar example. There are also the odours from various kinds of medicines and applications, together with different sorts of food, taints of breath and personal exhalations, the tendencies of which to rise or fall, or hang about indefinitely, cannot be precisely traced.

To the professional practitioner, who has to put up with these things in the way of business, for comparatively limited periods at longer or shorter intervals, the consequences are not so serious as they are to patients who have no escape from them for days, weeks, or months together. It is really in their interests, altogether apart from direct contagion, that ventilation should be unqualified and efficient, and, where there is risk of contagion, all the stronger is their claim to consideration.

It cannot, therefore, be too urgently insisted upon that every form of automatic or passive ventilation is always unreliable and often worthless. It is so entirely dependent upon external temperature, wind, and weather, that it may be truly said to act most when least



required, and to totally fail in its action when ventilation is most needed. The only reliable and invariable resort is mechanical ventilation, with motive power to an extent so moderate as to cost extremely little while doing its work (which when properly applied it does) so quietly as to be imperceptible except for its complete purifying effect.

Mechanical ventilation, skilfully applied, effects the total withdrawal and renewal of the whole atmosphere of any substantial interior, however large, in from every five to every fifteen minutes, or at longer intervals if considered sufficient. Wherever it is in operation, all gases of whatever nature, including objectionable odours, as well as floating dust particles, are progressively cleared out, giving place to pure air, simultaneously admitted at inlets provided for the express purpose. Great as is the perceptible advantage, the imperceptible advantage surpasses it. If air were visible, effective ventilation would be much easier to demonstrate. The slow and general movement of all the air in a room would then be recognised as most beneficial, and any intense local rush or "draught" would be voted intolerable. The difference between *pressure* and *volume* could then be more easily perceived. It is a distinction that must be clearly understood before reliable judgment upon ventilation can be arrived at. It is also necessary to comprehend the advantage of rendering it impossible for anything to stagnate and thus to become a permanent source of mischief.

In perfecting mechanical ventilation, experience and judgment are both essential. Consistently with the mode of warming, recommended in the previous article on "Temperature," the outlets must be as low as possible. The mechanical force disposes of the cool air, together with all impurities, with slightly increased velocity, at the same time operating as a diffuser and equaliser of beneficial warmth. Hence are combined the supply of perfectly pure air, completely and uniformly

warmed, and the adjustment of temperature.

Nor is the advantage limited to winter and warming. In summer, especially in the very sultriest weather, the mechanical force draws out the air before it can become seriously vitiated, and its place is continually supplied through the inlets which then communicate with a cooling chamber, the supply of cool pure air being always reliable, constant, and free from draught.

Busy men, of all others those most engaged in professional pursuits, have the least time to devote to the details of problems like these. Their solution is the object of what is becoming more known as the Blackman-Smead system. Presuming that such system is capable of every achievement referred to in these articles, as is claimed, it is important to put the claims to the severest tests by challenging the performance of what is declared to be not only possible but a matter of course when undertaken by competent hands. More especially, it devolves upon all whose interests or whose sympathies are in favour of hospital progress, to give some attention to claims so directly bearing upon public health and individual welfare. So far as the particulars before us go, there seem to be elements of increased hope that, apart from the broad interests of hospital practice in general, the theories are open to extension to the treatment of contagious diseases upon lines not yet laid down, but which we may hope to see clearly indicated and acted upon with success before very long.

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#### VARIOUS KINDS OF BREAD, ETC.

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IN consequence of the length of the article on the "Dietetic Value of Bread," published in *HYGIENE* for June, we found it desirable to postpone our remarks upon special varieties of bread. We now propose to deal with some of the principal in alphabetical order.

*Aërated Bread.*—This is prepared by a process invented by Dr. Daughlish, which for a number of years was, commercially speaking, a failure, but is duly appreciated at the present day. Pure carbonic acid gas, previously prepared separately, is forced into water which becomes charged with it like soda water. Next, the flour for making the dough is mixed with this carbonated or aërated water in a strong iron vessel, under pressure. When the dough thus made is put into the oven to bake, it naturally rises, owing to the expansion and escape of the carbonic acid gas, after the pressure has been removed, and under the influence of heat. Salt is added in the proportion of 3 lb. to each sack of flour (280 lb.), giving 220 grains to each quartern loaf, or 55 grains to every pound of bread. The absence of any appreciable extent of fermentation deprives aërated bread of much of the flavour which renders other kinds more palatable. At the same time it must be borne in mind that, as acetic acid, which is a product of fermentation, is not formed, this kind of bread is very seldom sour.

*Cyclone Bread.*—This is a whole-meal bread, made, as its name implies, from cyclone whole-meal flour. Neither the old-fashioned millstones nor the modern rollers are used in grinding the flour. The method employed is fitly termed “cyclone,” for it consists in bringing the wheat under the action of powerful cross-currents of air in such a manner that the grains are converted into fine flour by their being ground against each other. The apparatus consists of a small chamber provided with two fans revolving in opposite directions. When the wheat is passed down through a hopper into this chamber, the artificial “cyclone” created by the fans speedily reduces it to the condition of powder. A reel which communicates with the milling chamber is kept constantly revolving, and a strong exhaust current is caused by a fan placed at the top of the reel; thus, the flour is drawn out of the milling chamber into a collecting-room,

whence it is filled into bags. The apparatus is so devised that if, instead of the finest flour, different grades are required, they can be obtained by various adjustments of the machinery. This singular method of reduction to meal presents several advantages, amongst which may be specially mentioned:—1. That a fine wholemeal flour is obtained; 2. That the meal is completely aërated; 3. That it is free from extraneous impurities; and 4. That there is less waste than in ordinary whole-meal bread. As regards the first-named of these advantages Mr. Goodfellow specially points out, in his work on the “Dietetic Value of Bread,” that the question of the fineness of the flour used is a most important one, seeing that large particles are apt to create irritation of the bowels, with its consequent evils. Moreover, coarse particles give rise to a feeling of dislike through the uncomfortable sensation of irritation to the mucous membrane of the mouth and the tongue.

The following analysis by Mr. Goodfellow of the dry solids contained in “Cyclone” bread, shows a practically normal ratio of proteids to carbo-hydrates, in the proportion of 1 to 3·6.

|                                      |        |       |
|--------------------------------------|--------|-------|
| Nitrogenous (gluten, etc.)           | ... .. | 19·41 |
| Carbo-hydrates (starch, sugar, etc.) | ... .. | 71·67 |
| Fat                                  | ... .. | 2·19  |
| Fibre                                | ... .. | 3·44  |
| Mineral Matter                       | ... .. | 3·29  |

100·00

“Cyclone” bread is easy of digestion, and owing to the large amount of nitrogenous matter, or proteids, as well as of mineral matter—chiefly phosphates of iron and potash—which it contains, it constitutes an excellent article of diet for everyone, but especially where there is a great demand upon the system, as in the case of those who have much brain-work to perform, women who are nursing, and growing children.

*Diastase Bread.*—Diastase, or, as it is sometimes called, maltin, is a soluble nitrogenous substance belonging to the albuminoid group,



and possesses the power of being able to change starch into dextrin and sugar, thus facilitating digestion. This property of diastase has been admirably utilised by Mr. Thomas Fletcher, of Birmingham, in his patent method of bread-making. Not only is bread thus made—*i.e.*, by the addition of diastase to the flour during the doughing stage—rendered much easier of digestion than ordinary bread, but it is of better texture, has an agreeable “nutty” flavour, and does not so soon get dry or mouldy. The additional cost of using diastase in bread-making is stated by the Patent Diastase Bread Improvement Company, Limited, formed to carry on Mr. Fletcher’s valuable invention, not to exceed from 4d. to 6d. per sack (280 lb.) of flour; the veriest trifle, when the benefit to the consumer and the advantage to the baker are taken into consideration.

*Eureka Flour.*—This is the name given by Messrs. Coombs to their aerated flour, for making cakes, pastry, puddings, buns, etc. It consists of pure wheaten meal, with a small quantity of tartaric acid and carbonate of soda; the chemical action of these two substances results in the liberation of carbonic acid gas, which produces aëration of the whole mass. The pastry made with it is consequently lighter than that for which ordinary flour is used, no baking powder is required, there is a saving of time in making, and its digestive properties are indisputable. As one of the judges at the International Food and Cookery Exhibitions we have had opportunities of seeing it satisfactorily submitted to thorough practical tests. We note, as evidence of increasing popularity, that Coombs’ Eureka flour has gone on steadily increasing annually, since 1885. The sales in that year were 12 tons; in 1891, they amounted to upwards of 1,075 tons.

*Frame Food.*—This is an extract of the nutritive constituents of the bran, by a special mechanical process, which adapts them for dietetic purposes, instead of their being more or less indigestible, as is commonly

the case when the bran exists in coarse particles.

The subjoined analysis made by Prof. P. F. Frankland, F.R.S., will fully suffice to prove the efficacy of the process in extracting the nutritive constituents and reducing them to an assimilable condition:—

|                               |     |     |     |     |     |        |
|-------------------------------|-----|-----|-----|-----|-----|--------|
| Albuminoids                   | ... | ... | ... | ... | ... | 21.40  |
| Sugar                         | ... | ... | ... | ... | ... | 12.30  |
| Dextrin                       | ... | ... | ... | ... | ... | 22.60  |
| Starch                        | ... | ... | ... | ... | ... | 13.00  |
| Other organic matter          | ... | ... | ... | ... | ... | 10.43  |
| Phosphoric acid               | ... | ... | ... | ... | ... | 3.68   |
| Potash                        | ... | ... | ... | ... | ... | 4.24   |
| Iron and other mineral matter | ... | ... | ... | ... | ... | 2.77   |
| Water                         | ... | ... | ... | ... | ... | 9.58   |
|                               |     |     |     |     |     | 100.00 |

Particularly noticeable is the large proportion of alkaline phosphates, chiefly of potash and magnesia.

When the “Frame Food” extract is added to white flour in the proportion of 1 ounce of powder to 7 lb. of flour, there is a marked increase in its nutritive value, through the restoration of ingredients of which it had been robbed by the separation of the bran in milling, as shown by the following analysis by Mr. Goodfellow:—

|                                   | Fine<br>White<br>Bread. | “Frame<br>Food”<br>Bread. |
|-----------------------------------|-------------------------|---------------------------|
| Water                             | 37.0                    | 38.4                      |
| Proteids (Gluten, etc.)           | 7.5                     | 12.1                      |
| Carbo-hydrates (Starch and Sugar) | 53.8                    | 47.2                      |
| Fat                               | 0.8                     | 0.9                       |
| Mineral Matter                    | 0.9                     | 1.4                       |
|                                   |                         | 100.0                     |
|                                   |                         | 100.0                     |

It will thus be seen that “Frame Food” bread contains 60 per cent. more nitrogenous matter, and 50 per cent. more mineral matter than can be found in white bread. Besides the “Frame Food” being available for making pastry, cakes, and other farinaceous preparations, it is manufactured in combination with cocoa, jelly, and porridge, all of which are greatly improved in strength and quality by the admixture.

*Hovis Bread.*—Prof. Church, in his standard treatise on food, states that it is a matter of

regret that the portion of the wheat grain, called the germ, is so often removed in the milling process, because its presence in the flour tends to discolouration, and for other reasons of expediency; for the germ is singularly rich in oil, in nitrogenous matters, and in phosphoric acid. Prof. Church says that the germs consist as under:—

|                                      |      |
|--------------------------------------|------|
| Albuminoids, diastase, etc. ... ..   | 35·7 |
| Starch, with dextrin and maltose ... | 31·2 |
| Oil, or fatty matter ... ..          | 13·1 |
| Mineral Matter ... ..                | 5·7  |
| Cellulose ... ..                     | 1·8  |
| Water ... ..                         | 12·5 |

Now, more than half of this mineral matter is phosphoric acid; in fact, as it amounts to 60·6 per cent. of the total ash, it is apparent that the embryo, or germ, contains nearly  $3\frac{1}{2}$  parts per 100 of this important constituent. At the same time, it may be remarked that the albuminoids, or nitrogenous matter, amount to three times the quantity existing in the whole wheat grain, while the fatty matter is more than six times as much. Further, under the head of albuminoids is included a considerable quantity of diastase. Bread and biscuits made from Smith's patent germ flour are known by the name "Hovis," to protect the public against fraudulent imitations.

*Gluten Bread.*—Gluten is an albuminoid, really composed of four albuminoids, viz., gluten film, gluten-casein, gliadin, and mucedin, contained in wheaten grain; it can be obtained by mixing some flour and water so as to form a compact dough, then washing out the starch by means of a stream of water, when the residue is a greyish-yellow, tough, elastic mass, that can be drawn out into threads. When this gluten is baked in the shape of small loaves, or rolls, these "rise" to a great size, compared with that of the gluten mass previous to baking; and, when cut into, large hollow spaces are noticeable in the interior of the loaf. Consequently, the weight is much less than half of an ordinary loaf of similar size and external appearance. Having

been deprived of the starch and soluble matter, gluten bread is almost devoid of such flavour as one is accustomed to find in bread, as usually made. It is employed in the dietary of persons suffering from the peculiar affection known as diabetes; in which there is a morbid tendency to convert the starchy constituents of food into sugar. In some instances, especially when the disease is not of long standing, and not of a complicated character, the diabetic condition will be kept at a minimum and even wholly disappear, with strict non-starchy regimen.

*Bran bread*, made of bran which has been specially deprived of starch and of the irritant fibrous portion, is an excellent occasional substitute for gluten bread in such cases.

*Malted Bread.*—When properly prepared, bread which has had malt added to it during the process of making, is more palatable, more digestible, and more nutritious than ordinary bread. These improvements in its condition are due to the diastasic action on the albuminoids, whereby they are rendered more soluble. In most instances the bread is malted by the addition of malt extract to the doughy mass, during what is called the doughing stage; but there is one kind, Montgomerie's Malt Digestive Bread, prepared in accordance with a method devised by Mr. John Montgomerie, of Partick, in which the malt extract is added to part of the flour previous to the doughing stage, and, as a consequence, the diastase of the malt has fuller time to act on the starch and to convert this into dextrin. The improvement thus effected is evident in the flavour, appearance, greater digestibility, and general superiority of bread thus prepared over other varieties of malted bread. Mr. Goodfellow pointedly refers to these facts, and sums up his account of Montgomerie's process by the statement that it secures a larger proportion of soluble carbo-hydrates in the bread, and that it is one of the most digestible in the market, while its flavour is most delicate and pleasing. In ad-



dition to bread, Mr. Montgomerie has applied his patent to the manufacture of biscuits and rusks. The last named are most valuable for infants, invalids, and, indeed, all who suffer from weak or imperfect digestion; being, like the bread, partially pre-digested as it were, through the diastasic action which has been described, the process of digestion is rendered proportionately quick and easy. We can vouch personally for the beneficial results from using Montgomerie's Malted Rusks in one case, namely, that of the late Dr. John Milner Fothergill, a great authority upon dietetics, and one of the early members of the staff of HYGIENE. He found them so excellent and reliable that he would use none other during his illness. Unfortunately, he experienced some difficulty in getting a regular supply of them; as Mr. Montgomerie had not at that period (1888) organised the numerous agencies which he now has in the principal towns of Great Britain.

*Triticumina Bread.*—This is made from a kind of flour specially prepared by Meaby's patent process; whereby the bran is ground extremely fine, and the starch made more easily acted upon by the gastric and other digestive fluids. It is, therefore, an entire wheat-meal bread; and all of the nutritious constituents of the grain are retained in the meal. The bulk of whole-meal flours are not sufficiently fine, and the necessary result is that the coarse bran particles in them create injurious irritation of the digestive canal; on the contrary, triticumina has a beneficial, slightly stimulating action. Moreover, it must be borne in mind that in the case of ordinary whole-meal bread there is a loss of  $12\frac{1}{2}$  per cent. through non-assimilation; while only  $7\frac{1}{2}$  per cent. waste from its being undigested occurs in respect of triticumina bread.

In white bread, the proportion of nitrogenous matter to the carbo-hydrates is 1 to 7; while in triticumina bread the ratio is as high as 1 to 3.6. The mineral matter (3.35 per cent.) is

composed chiefly of phosphoric acid, with potash, magnesia, and lime; a circumstance rendering triticumina bread of particular value in the daily dietary of children, and of women during lactation. Biscuits made from this meal would, doubtless, meet with a ready sale.

Triticumina bread has the advantage of keeping moist for a longer period than other whole-meal bread, partly because the flour from which it is made absorbs a considerable percentage of water, partly because the relatively larger proportion of soluble matter in it has a tendency to maintain it moist. In short, triticumina bread is as nearly perfect as it can be.

*Biscuits.*—Although this article has been almost limited to various kinds of bread, we cannot omit to refer to biscuits, which have, during the past years, reached a degree of perfection previously unknown. Their principal difference from bread is derived from the circumstance that they are baked at a high temperature until nearly all of the water is removed from them. Fancy biscuits do not always follow this rule; nor, indeed, do they follow the rule from which the name was originally derived—*bis cuit*, twice cooked or baked. Rusks, however, illustrate the rule, and not the exception. These are made with flour, milk, and butter, sweetened according to requirements, lightly baked at first similarly to bread; next, they are cut into slices and baked in a quick oven to make the outsides crisp and firm, and finally, they are thoroughly dried by being subject to a lower degree of heat for some hours. The most perfect we have ever tasted are the coffee rusks recently introduced by Messrs. Peek, Frean, and Co., a firm of world-wide reputation for the excellence and variety of its productions. In the present day, when nearly everything sold is labelled "made in Germany," it is highly gratifying to our feelings of insular self-respect that foreigners cannot even so much as pretend to compete with home manufacturers when biscuits are in question.

## PRECAUTIONS AGAINST CHOLERA.

IN HYGIENE for August we published some valuable suggestions drawn up by Sir George Buchanan, M.D., F.R.S., until recently the Senior Medical Officer, Local Government Board. Some of our contemporaries seemed to think that we were premature in this respect, and, in fact, that we might cause unnecessary alarm. How far they were right in their views may be gathered from the fact that within three weeks from our publication, cholera, which has for some time been travelling steadily westward across Europe, is at last in full evidence in our midst. We now publish important extracts from an official document issued to local authorities in 1888, when there was a prospect of an outbreak of this epidemic in England. These have reference to water supply, and numerous other sanitary matters, and are equally applicable to other forms of epidemic disease.

If, unfortunately, the only water which for a time can be got should be open to suspicion of dangerous organic impurity, it ought at least to be boiled before it is used for drinking, but then not to be drunk later than twenty-four hours after it has been boiled. Filtering of the ordinary kind cannot by itself be trusted to purify the water. It cannot be too distinctly understood that dangerous qualities of water are not obviated by the addition of wine or spirits.

When there appears any probable relation between the distribution of disease and of milk supplies, the cleanliness of dairies, the purity of the water used in them, the health of the persons employed in them, and the health of the cows that furnish milk, should always be carefully investigated. Even apart from any apprehension of milk being concerned in a particular outbreak of disease, it is desirable that English people should adopt the custom, which is always followed in some Continental countries, of boiling all milk at once upon its reception into a house.

The washing and lime-whiting of uncleanly premises, especially of such as are densely occupied, should be effected with all practicable despatch.

Overcrowding should be prevented. Especially where disease has begun, the sick-room should, as far as possible, be free from persons who are not of use to the patient.

Ample ventilation should be enforced. It should be seen that windows are made to open, and that they are sufficiently opened. Especially where any kind of infective fever has begun, it is essential both for patients and for persons who are about them that the sick-room and the sick-house be constantly traversed by streams of fresh air.

The cleanliest domestic habits should be enjoined. Refuse matter should be speedily removed or destroyed, and the things which have to be disinfected or cleansed should always be disinfected or cleansed without delay.

Special precautions of cleanliness and disinfection are necessary with regard to infective matters discharged from the bodies of the sick. The caution which is necessary with regard to such matters must, of course, extend to whatever is imbued with them; so that bedding, clothing, towels, handkerchiefs, and other articles which have been in use by the sick may not become sources of mischief either in the house to which they belong or in houses to which they are conveyed.

All reasonable care should be taken not to allow infective disease to spread by the unnecessary association of sick with healthy persons. This care is requisite, not only with regard to the sick house, but likewise with regard to schools and other establishments wherein members of many different households are accustomed to meet.

If disease begins in houses where the sick person cannot be properly accommodated and tended, medical advice should be taken as to the propriety of removing him to an infirmary or hospital. Every sanitary authority should



have in readiness a hospital for the reception of such cases.

Where dangerous conditions of residence cannot be promptly remedied, it will be best that the inmates, while unattacked by disease, remove to some safer lodging.

Privation, as predisposing to disease, may require special measures of relief.

In certain cases special medical arrangements are necessary. For instance, as cases of cholera in this country often begin somewhat gradually in the comparatively tractable form of what is called "premonitory diarrhoea," it is essential that, where cholera has appeared, arrangements should be made for affording medical relief without delay to persons attacked, even slightly, with looseness of bowels.

It is always to be desired that the people should, as far as possible, know what real precautions they can take against the disease which threatens them, what vigilance is needful with regard to its early symptoms, and what (if any) special arrangements have been made for giving medical assistance within the district. For the purpose of such information printed handbills or placards may usefully be employed, and in cases where danger is great, house to house visitation by discreet and competent persons may be of the utmost service, both in quieting unreasonable alarm, and in leading or assisting the less educated and the destitute parts of the population to do what is needful for safety.

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## NOTES ON THE MANAGEMENT OF TYPHOID FEVER.

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By the late SIR W. W. GULL, Bart., M.D.

1. TYPHOID is a disease which runs a more or less definite course. It cannot be stopped or cured by medicines.

2. The chief thing to be done at the outset

of an attack is to send the patient to bed so as to save strength from the beginning.

3. No strong purgative medicines are desirable.

4. As the fever develops and the strength grows less, light food should be given at short intervals. This must be directed medically, but in general it may be said that the amount required is that which induces repose and sleep.

5. The bowels may be left to themselves. If unmoved for 24 hours or 36 hours a lavement of warm water may be necessary.

6. The restlessness or wakefulness in fever is best remedied by the careful giving of wine or spirit with the food or in water. Sedatives, such as opium, are inadmissible — mostly injurious.

7. The bedroom should be kept at a temperature of 62° to 64°.

8. Great care is necessary to keep the bed clean and sweet. This is most easily done by having in the room a second bed, to which the patient can be removed for two or three hours daily whilst the other is thoroughly aired and the linen changed.

9. All fatigue is to be sedulously avoided. No visitors should be admitted, and no other person but a nurse, and one attendant to help her.

10. The patient's room should never be left unattended for a moment, as, in the delirium of fever, the patient might jump from bed and injure himself.

11. As to medicines and the treatment of complications, the immediate medical attendant must be responsible.

12. As the discharges from the bowels in Typhoid Fever are a source of contagion, it is desirable that before being thrown down the closet they should be largely mixed with some disinfectant. On the same principle the strictest cleanliness must be observed in the sick room.

13. There is no reason to believe that

Typhoid Fever is contagious from person to person in the ordinary way. The largest experience shows that it does not extend like an ordinary contagious disease to nurses or others attending upon patients suffering under the disease.

### GOURMAND AND GOURMET.

THESE well-known terms in the French language are often made use of, but not always with sufficient discrimination. It will not be uninteresting, from a dietetic point of view, to enter upon a consideration of these two most distinct characters; the difference between them being so great that they may be regarded as complete opposites.

The *gourmand* is a mere glutton, who eats as much as he can at a meal, devouring one plate of food after another. In short, he is simply an animal with a huge uncontrolled appetite, feeding much as a dog feeds, with this exception in the dog's favour, that the *gourmand* is more omnivorous than the dog. He is the sort of man who would not omit any one dish at a table d'hôte, and who would, in all probability, wind up with the grumbling assertion that he cannot dine properly at that hotel. In fact, whether dining at home or abroad, his animal nature predominates to such an extent that he cannot be fairly ranked as a civilised being.

The *gourmet*, on the other hand, is a product of high civilisation. He enjoys, while he is discriminative in, his food, and he is quite on the side of moderation and temperance; and he even values the commonest articles of diet, if they are excellent of their kind. A French *gourmet* once remarked, "I am very fond of oysters, but I never exceed one dozen, being convinced that after that quantity the palate has become incapable of fully appreciating the flavour." A real *gourmet* preserves his palate in the healthiest and most natural condition. He would not smother an oyster with pepper, nor even squeeze a lemon over it. Plain

things are often preferred by a *gourmet* to the richer sorts of food. Persons indifferent to niceties of flavour will drink wine and eat cakes at the same time. Not so the *gourmet*, unless the wine were unworthy of attention; with a wine of good quality he would rather eat a plain crust of bread. A *gourmet* prefers the simplest meal, such as a beef steak or mutton chop, if really well cooked, to an elaborate banquet badly or unsuitably prepared. Thackeray, in his imitation of Horace's ode, "*Persicos odi*," hit this peculiarity off well in the second stanza, when praising the virtues of a single, simple dish:—

But a plain leg of mutton, my Lucy,  
I prythee get ready at three;  
Have it smoking, and tender, and juicy,  
And what better dish can there be!

To sum up, it may be said that the *gourmand* makes a god of his belly, that he "lives to eat," with no regard for anything but quantity; on the contrary, the *gourmet* "eats to live," with a chief regard for the quality of the viand, and the excellence of its preparation for the table.

### THE RATIONAL PUNISHMENT OF CRIME. — THE ELMIRA (U.S.A.) REFORMATORY.

By C. R. DRYSDALE, M.D.

THE ideal of lawgivers in uncivilised states of society has been that revenge should enter a good deal into the plan of punishment which they have adapted for criminals, and a dismal tale might be related of all the cruelties inflicted by judges and juries even in this century and in this enlightened country. Even within the last twelve years, a deputy of the Dutch Parliament remarked to me that the treatment of prisoners in Holland was a mere bagatelle compared with the plank bed and other horrors of our modern English prisons. Another Dutch friend told me some weeks ago that there is no longer in Holland any case in which conviction for crime entails the death of the criminal, and that,



notwithstanding all that, or in consequence of this fact, there have been very few murders committed in Holland for many years past. I wish we could say the same as regards this country.

In the United States the idea has been gradually growing that the reformation of the criminal is the best method for securing the public against any future crime on his part; and, of course, the idea of revenge has now passed out of the thoughts of all competent thinkers on the prevention of crime. Reformation is the only sure protection from crime, say the Americans, who have most experience, and, accordingly, during the past fifteen years an experiment has been going on in the State of New York to test the truth of this hypothesis. In New York and Ohio, at the discretion of the Courts, sentences are now passed on criminals for an indeterminate time of imprisonment, in place of our *time* sentences, one of which has recently occurred in the case of a poor boy sentenced for life.

The New York State Reformatory is located at Elmira, 200 miles from the city, and contains 280 acres of land, sixteen acres of which are occupied by the prison buildings. There are at this institution more than 1,400 male prisoners, all criminals, between the ages of sixteen and thirty, who have not had any former conviction for high crimes. The managers of this reformatory are empowered by statute to set free any prisoner when it is considered that he has been brought into a state which is compatible with the safety of society if he is allowed to be free. The average period of restraint in this institution is rather less than two years; and a man imprisoned for a heinous crime, involving a maximum of twenty years, may, if it be thought fit, be released before another with a sentence of five years. The ruling desire of all prisoners is for liberty, and their whole time is occupied from morning to night with responsible duties which they know, if performed well, will lead

to their being set free. The prisoners are not employed to earn for the State, but learn to earn for themselves when the day of their release arrives. The reformation of criminals which society needs is their transfer from the predatory to the productive class. No man, whatever be his offence, ought ever, says Mr. L. Brockway (*Fortnightly Review*, May, 1892) to be discharged from restraint except upon reasonable evidence that he is morally, intellectually, and physically capable of earning a livelihood. The industrial training of criminals is obviously, then, the desideratum of all true punishment. It seems to me that, among all the improvements of this wonderful century, none are more likely to lead to the welfare of the poorest classes than this reformatory system of New York. "Reformation, not revenge," must be the motto of legislators of the future.

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## PUBLIC HEALTH REPORTS.

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KENSINGTON (Medical Officer of Health, Dr. T. Orme Dudfield).—Dr. Dudfield is one of the oldest, as well as one of the best known, medical officers of health in the metropolis, and his reports are invariably interesting and instructive. These are now published every four weeks.

Kensington is a populous parish, the number of its inhabitants being about four per cent., or one twenty-fifth, of the population of all London. It is also both a favoured and favourite place of residence; the bulk of the residents being in good circumstances, living near large open spaces and in localities where manufacturing processes are not carried on to a large extent, while other conditions are of a satisfactory character. It is not surprising, therefore, to find that in June the death-rate was equivalent to 15·8 per 1,000 per annum, that of the whole metropolis being 17·7 per 1,000 during the corresponding periods. Other monthly reports for the current year show a decided balance in

favour of Kensington as compared with the rest of London.

In the June report, just referred to, Dr. Dudfield commented upon the prevalent epidemic of scarlet fever. "Scarlet fever," he wrote, "is still spreading, and as the usual time of maximum prevalence is still somewhat distant, it is to be feared that worse has to come." He wrote with a prophetic pen; for in the report, No. VII., comprising the four weeks ending on July 16th, he observes that the notifications of scarlet fever in the metropolis in the four weeks exceeded the number in the preceding four-weekly period by 616; that the cases admitted to hospitals were more numerous by 402, and that the cases in the hospitals on July 16th were 2,488, being 543 above that of June 16th. At the present date, August 18th, it appears from the returns published in the daily papers that 3,482 patients, 3,085 suffering from scarlet fever, are under treatment at various institutions belonging to the Metropolitan Asylums Board.

Two instances are recorded of the many ways in which infectious diseases may be spread, and illustrative of the vigilance necessary. In the first, "a child, aged 10 years, was taken ill on or about May 27th. She with her mother and an adult sister occupied a single room. The mother and sister worked at two laundries. A doctor was called to see the child on May 31st, but did not notify the illness. On June 4th another doctor was called in, and he notified the case, but he neither removed the child to hospital, nor referred to the circumstances as above set out. The facts came to light on visitation of the case on Monday, June 6th, following the notification. I wrote to the certifying doctor stating the facts and advising removal, but had no answer. I wrote to the mother and to the laundresses, intimating that the attendance of the mother and the sister at their places of work must cease till the child recovered, unless she was removed to hospital forthwith. I had no reply from any of the

parties, but the child was removed to hospital on June 9th." The other illustration is as follows:—"Three children of a coachman contracted scarlet fever; the nature of the illness appears not to have been recognised, and soon the children were out and about as though nothing had happened. The father shortly afterwards fell ill and, a doctor having been called in, he was found to be suffering from scarlet fever. The doctor examined the children and found that three of them were peeling,\* and notified all four cases. He cautioned the man not to go out, or allow his children to go out. Notwithstanding, the man did go out, and allowed his children to go out, even after he had been again cautioned both by the sanitary inspector and by his employer." After all this defiance of the law, and disregard of repeated admonitions, it is not surprising to learn that the Sanitary Committee have directed proceedings to be taken against the father, under Section 68 of the Public Health Act.

With reference to the notification of infectious diseases, during the four weeks which ended on July 16th, the number of cases of infectious disease notified to the several metropolitan medical officers of health were 3,792; of these cases, 2,404 were cases of scarlet fever, 629 of diphtheria, 189 enteric or typhoid fever, and small-pox 31. Dr. Dudfield is one of those who advocates the inclusion of measles in the list of notifiable diseases as set out in the Public Health Act. The School Board for London have addressed a communication to the London County Council, expressing the Board's opinion that it would be desirable to include measles amongst the notifiable infectious diseases, and urging the Council to exercise the power conferred upon them by the Act, and constitute measles a notifiable infectious disease. The Council decided to inquire into the question before proceeding further, and have not yet given a definite reply. There should not be

\*The peeling, or desquamative, stage is that at which scarlet fever infection is most active.



any doubt as to what that reply should be. Thousands of children die, every year, in London alone, from measles, and we have no hesitation in asserting that much of that enormous annual mortality is due to the common notion that measles is not a dangerous complaint, and to its not being brought under proper control by inclusion amongst notifiable infectious diseases.

Reports of police court cases in which it has transpired that the London Water Companies have exercised the right of cutting off house water supplies to a gross and scandalous extent have aroused public attention to the subject. As a matter of fact, if a water company thus exercises its powers, in accordance with the Waterworks' Clauses Act, 1847, it creates a nuisance liable to be dealt with summarily under the Public Health Act, and the local Sanitary Authority is bound to issue a notice for the abatement of the nuisance. This is the opinion stated by the medical officer of health for Chelsea, in a report made by him to the Vestry of Chelsea, with reference to the power of water companies to cut off the water supply from houses, on account of non-payment of rent, or other causes; and it is a view which must commend itself to every practical sanitarian. As long ago as 1883 the Vestry of Kensington, acting on the recommendation of the Works and Sanitary Committee, adopted the following resolution:—"That the sections of the Water Acts conferring on the water companies the power of cutting off the water from premises should be repealed, such other powers to enable the companies to recover rates or make good fittings being substituted, as to the wisdom of Parliament shall appear equitable." In the report of the Royal Commission on the Housing of the Working Classes, 1885, it was recommended that the companies be deprived of the summary power to cut off the water supply. Yet no steps have been taken to bring about this desirable condition. Dr. Dudfield, like some

other metropolitan medical officers of health, has repeatedly called attention to this subject. In his first monthly report for the current year he pointed out the inconsistency of the Law which, on the one hand, authorises a water company to cut off the water supply, thus creating a nuisance liable to be dealt with summarily, and on the other hand, requires the Sanitary Authority to take proceedings to abate the said nuisance. "The nuisance can be abated," remarks Dr. Dudfield, "only by restoration of the supply, upon payment of the water rate, and the Sanitary Authority thus becomes, in effect, the agent of the company to secure such payment—a position which is undignified, not to say ridiculous." But he derives satisfaction from the fact that as the London County Council have taken the matter in hand, a proper settlement of the question in the interests of public health may be ultimately expected.

BIRKENHEAD; population, April 4th, 1891, 99,249; area, 3,850 acres; Medical Officer of Health, Dr. Francis Vacher.—The county borough, as it is styled, of Birkenhead, comprises the townships of Birkenhead, with a population of about 60,000, Tranmere, containing upwards of 30,000 inhabitants, and the three smaller townships of Claughton, Oxtan, and Higher Bebington. These differ much in the density of population, ranging from 5·4 persons per acre in Oxtan, to 28·8 in Tranmere, and 48·5 in Birkenhead, a circumstance which has an apparently considerable influence on the relative death-rate, which is 7 per 1,000 per annum higher in Birkenhead than in Tranmere and Claughton, and even higher when compared with the practically rural districts of Bebington and Oxtan. During the past year, 3,286 births and 2,100 deaths were registered. The birth-rate, like the death-rate, as just mentioned, presents a higher ratio in the more densely inhabited than in the less populous townships constituting the borough.

Birkenhead is one of the twenty-eight great

towns of England, frequently referred to in the Registrar-General's periodical returns, and conveniently summarised in the following table, taken from the "Annual Summary of Births, Deaths, and Causes of Death in London and the other great towns, 1891."

| CITIES AND BOROUGHES.   | Estimated Population at Midsummer, 1891. | Annual Rate per 1,000 Living. |         |
|-------------------------|------------------------------------------|-------------------------------|---------|
|                         |                                          | Births.                       | Deaths. |
| London .....            | 4,221,452                                | 31·8                          | 21·4    |
| Brighton .....          | 115,606                                  | 26·3                          | 18·2    |
| Portsmouth .....        | 160,128                                  | 30·1                          | 19·0    |
| Norwich .....           | 101,316                                  | 31·9                          | 19·3    |
| Plymouth .....          | 84,464                                   | 29·8                          | 22·5    |
| Bristol .....           | 222,049                                  | 30·4                          | 20·9    |
| Wolverhampton .....     | 82,799                                   | 34·2                          | 24·2    |
| Birmingham .....        | 429,906                                  | 34·2                          | 22·2    |
| Leicester .....         | 142,581                                  | 33·9                          | 21·7    |
| Nottingham .....        | 212,662                                  | 29·9                          | 19·9    |
| Derby .....             | 94,496                                   | 30·6                          | 19·1    |
| Birkenhead .....        | 99,597                                   | 33·0                          | 20·9    |
| Liverpool .....         | 517,116                                  | 34·6                          | 27·0    |
| Bolton .....            | 115,253                                  | 34·1                          | 21·9    |
| Manchester .....        | 506,469                                  | 34·1                          | 26·5    |
| Salford .....           | 198,717                                  | 36·4                          | 26·0    |
| Oldham .....            | 132,010                                  | 31·1                          | 25·7    |
| Blackburn .....         | 120,496                                  | 33·9                          | 25·8    |
| Preston .....           | 107,864                                  | 36·0                          | 27·3    |
| Huddersfield .....      | 95,656                                   | 24·4                          | 23·0    |
| Halifax .....           | 83,109                                   | 26·2                          | 22·8    |
| Bradford .....          | 216,938                                  | 28·7                          | 22·2    |
| Leeds .....             | 369,099                                  | 34·1                          | 22·9    |
| Sheffield .....         | 325,304                                  | 36·6                          | 23·9    |
| Hull .....              | 200,934                                  | 34·6                          | 21·0    |
| Sunderland .....        | 131,302                                  | 37·8                          | 25·0    |
| Newcastle-on-Tyne ..... | 187,502                                  | 35·8                          | 23·8    |
| Cardiff .....           | 130,283                                  | 36·5                          | 22·1    |
| 28 Towns .....          | 9,405,108                                | 32·6                          | 22·5    |

It will be seen that out of the twenty-eight cities and boroughs twelve had lower birth rates, and only five had lower death rates than Birkenhead.

The proportion of deaths of infants (*i.e.*, children under one year old) to the births registered in Birkenhead in 1891 was equal to 148 per 1,000. In the other towns in the foregoing list the proportion was 167 per 1,000 during the corresponding period. It covered a long range, varying from 137 in Brighton to 214 in Leicester and 227 in Preston; both of the latter being towns in which factories give employment to many of the mothers, thus

depriving the infants to a considerable degree of the necessary maternal care.

From the excellent notes on the meteorology of Birkenhead, furnished by Mr. Hartnup of the Bidston Observatory, it appears that the mean temperature in 1891 was 48·3 degrees Fahrenheit, somewhat lower than in the two previous years. The annual mean barometrical reading of the locality is 29·915. The year's rainfall amounted to more than 32½ inches, very much above the yearly average; on one day, June 25th, it measured 2·072 inches. The local average of wind force in 1891 (the direction during half of the year being from westerly points) was at the rate of 16½ miles per hour, a high average. On December 11th last, the total wind force recorded by the anemometer for the whole 24 hours was 1,184 miles, giving the average hourly movement of the air at 49½ miles. This is sufficiently remarkable, but perhaps the most singular circumstance in this respect reported from the Bidston Observatory is that there were only two hours throughout the year, *viz.*, on November 27th, in which no wind force was registered. The proportion of cloud to clear sky, estimated twice daily, was 71 per cent. of the total, exactly the same as in 1890, and 1 per cent. less than in 1889.

Of the 2,100 deaths in the borough of Birkenhead during 1891, 2,082 were ascribed to specified causes, *viz.*—262 to zymotic diseases, 306 to constitutional diseases, 1,100 to local diseases, 316 to developmental diseases, and 98 to violence. The proportion of deaths from zymotic causes as compared with the whole number was consequently only 12·4 per cent., a fact which speaks well for the sanitary condition and supervision of Birkenhead, and, probably, for the hygienic value of constant wind currents. The most fatal of the chief zymotics—those of the miasmatic order—were fever, 46 (typhoid, 31, and typhus, 15); diarrhoea, 35; measles, 34; whooping cough, 30; diphtheria, 11; and scarlet fever, 5 only. It is interesting to



learn that typhus was limited almost entirely to two parts of the town, and that the greater proportion of the cases notified were successfully isolated in hospital. It is also interesting to know that since the middle of 1886 Birkenhead has been free from small-pox. What renders this immunity particularly gratifying is that on the other side of the Mersey this disease has appeared on several occasions in Liverpool during the period referred to. The mortality from influenza in 1891 was 48, 44 of these deaths occurring in 7 consecutive weeks, namely, from the 18th to the 24th week of that year; all but 3 of these 48 persons were upwards of twenty years of age, and 17 were upwards of sixty. The number of notifications of infectious diseases, under the provisions of the Act, was 1,007 in the twelve months.

Speaking of the 18 deaths which were registered, though not certified by any qualified medical practitioner, so that it may be concluded that the deceased had either been without attendance, or committed to the incompetent care of some quack, Dr. Vacher makes some noteworthy remarks. After showing that the alleged causes of death in the uncertified entries are absolutely valueless, he says:—"The ten deaths entered as due to premature birth, the five entered to convulsions, and the one to debility, are doubtless more or less accurate guesses at the truth; but they do not represent the whole truth. Such questions suggest themselves as:—Were the convulsions due to improper food? Was the debility due to neglect? Were the births premature because so arranged? That, year after year, the deaths of numbers of young children should be uncertified is discreditable. If professional advice is not obtained for an adult when sick, it may be owing to his own default, but if it is not obtained for a sick infant it is obviously referable to the neglect of others."

The ordinary operations of the sanitary

department at Birkenhead have, as Dr. Vacher puts it, received unremitting attention; whether as regards house-to-house inspection of cottage property, cleansing of gulleys and drains, removal of refuse, or the many other matters coming under daily notice. Dr. Vacher speaks in condemnation of the system of storing matter in ashpits close to houses, and is evidently in favour of the method adopted in many towns—Edinburgh, Dublin, and York, for instance—whereby each house is provided with a dustbox or pail, which is emptied by the dustmen early every morning. The ashpit system at Birkenhead costs more than £5,000 per annum, and this sum would go a long way towards defraying the cost of a daily collection if the change recommended by Dr. Vacher should be adopted.

In 1891, no less than 64,896 lb. of meat (59,051 lb. being beef) were seized by the inspector, and destroyed as unwholesome; in addition to this enormous quantity, nearly 1,000 lb. of fish with miscellaneous articles of food, fruit, and vegetables were also seized and condemned as unfit for human consumption.

The disinfecting house continues to do good service, and a new patent steam disinfector, erected by Messrs. Goddard, Massey, and Warner, is highly approved as superior in various respects to hot-air apparatus. We are glad to find that it is intended to erect two refuse destructors, for burning refuse, at convenient localities in the borough.

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## Reviews and Notices of Books.

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*Milk: A New System of Rapid Analysis.* By J. BARKER SMITH, L.R.C.P. Lond. London: Beaumont and Co., Limited, 39, Southampton Street, Strand, W.C. 1892. Price 1s.

THIS pamphlet is the first of a series dealing with food stuffs, and describes improved

methods of examining milk, cream, buttermilk, etc. These methods were incorporated in memoirs submitted to the Royal Belgian Academy, and accepted by that body in 1890 and 1891. So rapid is the method that the author states that in one minute, and from even part only of a teaspoonful of milk, the percentage of added water and that of albuminoids may be readily ascertained.

The chemical agent used by Dr. Barker Smith is potassium permanganate. Five milligrams of this substance, dissolved in fifty cubic centimetres of water, acidulated with sulphuric acid, constitute a *norme*, used chiefly for calculating and recording. A *subnorme*, invariably used in all the experiments described by the author, is exactly one-fifth part of a *norme*. For the experiments themselves, and the manner in which the author arrives at his results, we must refer readers who are interested to the pamphlet itself, which is well worthy of study by all who have to do with the analytical examination of milk, cream, and their products.

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*The Claims of Sanitary Science upon the Clergy.*

London: Francis Hodgson, 89, Farringdon Street, E.C. Price 6d.

A REPRINT of a paper read before the Derby Clerical Society, by the Rev. C. G. K. Gillespie, A.K.C., who has given much attention to practical sanitation, as evidenced by this pamphlet, and by his public lectures, one of which—on the Physical Effects of Air Pollution—is included in the series brought out under the auspices of the Manchester and Salford Noxious Vapours Abatement Association.

Although a comparatively small section of Mr. Gillespie's professional brethren recognise the value and desirability of some knowledge of hygiene, the majority are unfortunately like the young vicar of whom Mr. Gillespie tells an amusing story. Through Mr. Gillespie's practical acquaintance with the principles of sanitation, he was enabled to take steps which, in all human probability, saved the lives of

several children in a family stricken down with scarlet fever. He very naturally used this case as an argument, illustrating the opportunities of the clergy in this direction, when he was met with the scornful reply, "That is not work for a clergyman." If clergymen properly understood the sanitary code laid down by Moses in the Pentateuch, if they thought more of the tenderness and solicitude of Christ for the sick, it would be difficult to find anyone in their ranks who would make such an unfeeling, unsympathetic remark. As Mr. Gillespie rightly says, the overcrowding, the filth, the untidiness of the careless home have more to do with moral and spiritual decay, inseparable from physical degradation, than is commonly admitted. How can the very poor, living in miserable dens and squalid slums, be expected to think and say otherwise than "See how we are condemned to live in what we call our homes, and judge if we are likely to understand or care for religious teachers who appear content to let us live with less comfort than dogs, but expect us to think like human beings."

It must not be supposed that Mr. Gillespie desires to trench upon the province of the qualified medical practitioner. On the contrary, he is at great pains to point out the necessity of non-interference with the doctor in the medical treatment of the sick. "In matters of medicine," he says, "we shall certainly do best by bearing in mind the well-worn maxim, *Ne sutor ultra crepidam*. Till the doctor comes, we should know what to do in emergency, so as to prepare for his skilled ministrations. We may then often help him by enforcing his directions, while our message of faith calms the mind of the patient." Mr. Gillespie has a sly hit at such of his brethren as are inclined to dangerously dabble in physic, when he calls to remembrance the case of a clerical homœopathist whose unfortunate tampering with what he knew little or nothing of led to the fatal poisoning of a girl by an overdose of aconite.

We strongly recommend a perusal of Mr.



Gillespie's pamphlet, which abounds in useful suggestions, and we cannot better conclude our notice of it than by quoting the opinion which was given by a medical officer of health of wide and special experience, after reading the proof of this lecture:—"For many years I have seen the necessity of some such action as you put forward; and I know full well what admirable results might be obtained from it. Help, such as you yourself have rendered, is a practical demonstration by one individual which might be followed with equal advantage by others in your own calling, to the great and incalculable benefit of the occupants of our slums. Show them a way to be clean, make all their surroundings outside their dwellings wholesome, and then ask them to do their part inside. Then, finally, you may sow the good seed with greater prospect, and they will estimate better the value of religious teaching."

## BUILDING REGULATIONS.

Extract from paper read at the Aberdeen Congress of the Sanitary Association of Scotland, July 29th, 1892 (President, the Right Hon. the Marquis of Huntly), by GILBERT THOMSON, M.A., C.E., Member Sanitary Institution, Lecturer on Sanitation in the Glasgow and West of Scotland Technical College; with Observations made upon the paper by several members of the Congress.

1. *Extract from Paper.*—The standard of sanitary knowledge among tradesmen of all departments has been raised immensely within the last few years, and that to a great extent by their own efforts. In place of it being very exceptional, as it was, to find a man who knew anything of sanitary principles, there are now many who can be thoroughly trusted to do their work not only honestly, but also intelligently. The plumbers, on whom the chief responsibility rests, and who have had to bear a great deal of unmerited abuse, as well no doubt as some which they really deserved, have taken a very important step in furthering this progress. The movement for national registration, which enables the competent workman to get a sort of hall mark of competency, and its accompaniment of technical instruction, by which the rising generation may learn to work with head as well as hand, are calculated to raise great hope of further improvement, and when legislative sanction adds to the value of the certificate of registration, and con-

solidates the system of education, we may fairly expect to get rid of many of the evil effects of ignorance.

2. *Observations upon the Paper.*—Mr. A. M. SCOTT, Secretary to the District Council for Glasgow and the West of Scotland, of the National Registration of Plumbers:—I should like to make some observations upon the paper which has just been communicated by Mr. Thomson; but I may say at the outset that I am here as representing the plumbers of Glasgow and the West of Scotland. I think the paper is a very satisfactory one. It is valuable as well for its matter as its mode of treatment. Besides, it is highly suggestive. It may be remembered that at last year's Congress at Edinburgh I had the honour of reading a paper which dealt with technical education all over the United Kingdom of one of the building trades—I mean the plumbers' trade. Mr. Thomson's paper possibly coupled with the one I read, seems to me to mark a new departure on the part of the Sanitary Association in regard to the character and variety of the papers read at the Annual Congress. I understand that hitherto no papers have been read dealing *directly* with building construction; but as sanitation has to do with building construction from the very commencement the question is at once suggested: whether the deliberations at these Annual Congresses have not been on an insufficiently broad or comprehensive basis?

Mr. Thomson's paper also suggests to me the inquiry as to the amount of representation which the building trades have in these Congresses. I have been told, but casually, that there is no direct representative of these building trades here unless in the case of the plumber trade. Of course we are all aware that some members of health committees and other public bodies, members of the Congress, may be tradesmen; but what I think the Association should aim at, as giving greater value and influence to the Annual Congress, is a genuine representation of all the building trades. Take as an illustration of the kind of representation I mean: at the annual meeting of the faculty with which our President, Dr. Duncan, is connected, representatives are appointed for this hospital and that school. In the same way, at the annual business meetings of the several trades, the members of these trades would, I doubt not, be quite pleased to appoint their representatives to the Annual Congress of the Association. The presence at a sanitary congress of such responsible representatives would be very significant. We could not possibly over-estimate the value of the interchange of opinion as between such representatives on the one side, and medical and sanitary officers on the other. Once get the trades thoroughly interested in the work of such an Association with its Annual Congress, and I venture to say that some improvement would be found in building construction in landward districts from the sanitary point of view. Of course, in some of our large cities and towns the jurisdiction for

sanitary arrangements in connection with buildings from the very beginning of construction is pretty complete, but it is far otherwise in landward parts. It is chiefly just outside the walls of cities and towns that speculative builders, those economically organised beings, have their happy hunting grounds. Except the superior of the ground, there is no one to intervene with regard to either plan, mode of construction or drainage; and we know what a precious muddle of their work those dealers in stone and lime often make. I am sure the medical gentlemen present will bear me out when I say that they have had abundant experience of the consequences of defects arising from building construction outside of proper sanitary jurisdiction. These defects are commonly to be found in the connections between the plumber work in the house and the main sewer, but indeed it is sometimes found that there are no connections at all. I might venture to lay down the proposition, not as necessarily sound, but rather as one for discussion, that it is desirable in the interest of public health that undivided responsibility should be laid upon one tradesman for carrying out the entire drainage system of the house right out to the point of junction with the main sewer. In this connection it may be a perfectly fair question to submit for discussion at a future Congress, but I should not like to see it discussed unless there was present a sufficient representation of the building trades, whether the plumber should not be entrusted with that undivided responsibility.

In our day the plumber is fast becoming a technically educated, as well as practical, craftsman. The old rule-of-thumb practice is dying out, and the hall mark of registration is a sign that the public are now understanding. The public know that work executed by a registered plumber will be competently done.

But what signifies all our talk and all our work unless sanitary progress is amply provided for by legislation? I fully agree with the view given expression to by our Chairman, Lord Huntly, when he said that many of the so-called Imperial pieces of legislation were of little value compared with a thoroughly good Public Health Act for the country. Surely something ere long in the shape of genuine sanitary legislation will come from the Government. We know that both political parties in the State are agreed as to the necessity for legislation. Some of you may know that England is even far ahead of Scotland in respect of the existence of local authorities in landward parts under the Local Government Bye-laws; and these authorities, under the Bye-laws, have a certain amount of jurisdiction and supervision of work from the beginning of the building to the finish. Whether the District Councils we are promised will provide for the creation of local authorities in Scotland similar or superior to those in England, we, of course, cannot say; but it is obviously of the greatest importance that educated opinion in this country should be fully expressed as to the character of

the legislation that is desirable. In this good work the journal of the Association could render material aid by opening its columns to contributions and discussions. We were told at the business meeting on Wednesday evening that that journal was not prosperous—that indeed it was worked at a loss. Why should the journal not be the representative, from the sanitary point of view, of all the building trades? It seems to me not to require so very much organisation to bring that about. The circulation would then be most materially increased, and there would, I think, be fifty advertisements instead of five, as is the case for this month. But especially would the journal in such a case be valuable, as its influence would undoubtedly act and have a stimulating effect upon the work of the Congress. Let me repeat in conclusion that in my opinion Mr. Thomson's paper is at once instructive and suggestive.

A MEMBER OF THE CONGRESS:—With reference to what Mr. Scott has stated about the registration of plumbers, I doubt whether it will be of any use. In my experience I do not find any improvement in the work and it certainly has not brought about accounts more honestly charged.

MR. W. P. BUCHAN, *Glasgow*:—I fear the speaker who has just preceded me has been rather unfortunate in his experience with the plumbers he has come in contact with. I sympathise with him in his desire that plumbers, and especially registered plumbers, executing bad work should be exposed; but Rome was not built in a day, neither can the Registration of Plumbers movement transform sinning plumbers into saintly-acting ones all at once. The aim of the registration movement is and has been *improvement*, and the bad work which the gentleman speaking before me has seen emphasises the necessity for the passing of the Plumbers' Registration Bill, lately before Parliament, as soon as possible, so that powers may be obtained in order to deal with all persons executing bad work in such a manner as will cause them to amend their ways. In a short time, when the benefits of the useful and high-class education which the rising generation of plumbers now get in their technical classes come to be felt, and Parliament has passed the Registration of Plumbers Bill, then the days of scamped plumbing will be numbered. With the sanction of Parliament the registered plumbers of the future may aspire to be recognised as helpers to the noblest of the professions—I mean the medical—for by doing good work they will be acting up to that great desideratum, and end and motto of all true sanitation, "The prevention of disease is better than its cure."

MR. SCOTT:—I beg to be permitted to say a word with reference to what has fallen from the last speaker. The Bill before the last session of the late Parliament providing for the National Registration of Plumbers would obviously have been passed if time had permitted. It will be submitted to the first session of the new Parliament; and whenever it



becomes law no registered plumber will then venture to do work of an improper character or anything which would endanger his certificate of registration. The Bill amply provides in certain cases for the cancellation or suspension of the certificate. The result would be a protection to every respectable plumber, and the scamping tradesman, should he unfortunately be registered, would be in continual fear of losing, and would ultimately lose, his certificate. He would be very much like the soldier degraded for bad conduct. In fact, it would be against his own interest to scamp work.

Mr. JOSEPH POTTS, Burgh Surveyor of Partick:—Regarding the registration of plumbers, I have thought that it would be a good thing if the certificate number of the man who did the work were noted on the account. It would enable us always to identify the workman who did the work should anything go wrong.

### HYGIENIC NOTICES.

THE HUMANE SEAT.—In the evidence given by the Editor of *HYGIENE* before Sir John Lubbock's special Committee of the House of Commons in 1886, and before the Shop Hours Bill Committee of the House of Commons recently, stress was laid upon the injury done to the health of persons employed as shop assistants, through their being compelled to stand during the whole of the time devoted to business. In the case of women this is especially prejudicial to health; and it is quite within the mark to say that many hundreds, even thousands, of female shop assistants break down in the course of the year from this cause alone. Even in the interests of the employers, this is a practice which should be remedied, for it is manifestly to their advantage that their assistants should be relieved as much as possible from physical strain, and consequently able to give fuller attention to their duties. Some, indeed too large a proportion, of the principals of our great retail business firms, have a notion that if the assistants are seated when not employed in serving customers, the latter, on entering a shop where some of the persons behind the counter were temporarily resting themselves by a change of position, would arrive at the conclusion that little business was doing, and would transfer their custom to another establishment in the same line of trade. But such an assumption infers a low degree of intelligence and a still lower degree of humanity on the part of the customers, the vast majority of whom are women. In fact, the argument is not tenable, and it is within the power of customers to settle it at once and for ever. Unfortunately, we are all acquainted with instances of boycotting, political or social, more or less hateful in their character. Let us have one useful form of boycotting, viz.—a shop boycott, by ladies and others withdrawing their custom from every retail shop where proper sitting accommodation is not provided for the assistants.

This would very soon bring about a different state of affairs. There are, however, many shopkeepers who would furnish seats for their assistants but for the common difficulty that there is not adequate room behind the counter for the chairs. This objection has been swept away by the invention of what is appropriately termed the "Humane Seat." This can be fixed in the narrowest space behind a counter, and is so arranged that except when required for use it can be pushed under the counter and is completely out of the way. We strongly recommend it on philanthropic, practical, and economical grounds, and are glad to see that it has received the complete approval of the Early Closing Association. Mr. E. W. Gough, the inventor of the Humane Seat, already well known as the patentee of other useful articles, deserves high credit for his latest invention.

THE "LIFE-SAVING" LAMP EXTINGUISHER should be brought into universal use during the coming winter. Every newspaper reader must have observed the alarming frequency with which fires are caused, and serious injuries and even deaths of human beings are produced, through the accidental upsetting of paraffin lamps. Such accidents naturally occur more often in the small, crowded rooms of the poor than in the houses of the well-to-do classes, but the latter are not wholly exempt from risk. Only last year, Lord Romilly and two of his servants were burned to death at his lordship's town residence, in consequence of the upsetting of a paraffin lamp in the drawing-room. In the same year, 1891, the Metropolitan Fire Department reported 281 disasters from accidents with paraffin lamps—houses on fire, deaths from burning, and severe injuries. It is estimated that one fire out of every ten in London is caused by paraffin lamps. When to this number are added all the casualties similarly produced outside the metropolitan area, the total is simply appalling. Occasionally the mischief done is wholesale in its nature. Take, for instance, the burning of Chicago in 1871, when 250 persons fell victims to the flames, and 100,000 were rendered homeless; while the cost of re-construction amounted to £60,000,000. And what led to this fearful conflagration? Why, the accidental upsetting of a paraffin lamp in a wooden building, which was at once set in a blaze, the fire extending thence to all parts of the city. An accident with a paraffin lamp on board a Russian steamer, the "Vaira," on the Volga, resulted in the loss of more than 100 lives. Some idea of the danger constantly incurred in this country may be gathered from the circumstance that probably as many as 3,500,000 paraffin lamps are sold annually in the United Kingdom. The apparatus which is called the "Life Saving" Lamp Extinguisher, is simple, reliable, and automatic in its action. It consists of a collar made of brass, slipping over the wick holder, on the top of which a porcelain or metal cap is placed. Should the lamp happen to be upset the cup turns over on to the light of its own weight, and the light is instantaneously extinguished, through

the cap resting on the flame, choking it, or keeping off the air current. In whichever way it acts, the result is invariably the same, viz., that the flame is immediately put out. This apparatus can be made so cheaply that it can be sold at the low price of from one penny upwards, so that the poorest person has it within easy reach.

### DIETETIC NOTICES.

BELLIS'S TURTLE SPECIALITIES are getting well known, and what is of still greater importance, they retain all the good qualities which first brought them into repute. The principal are preserved turtle, extract of turtle meat, turtle soup, green fat, and fins. These are prepared from the West Indian species, held in deservedly high esteem by epicures. At one time delicacies of this class were scarcely obtainable by anyone below the rank of an alderman; but now, thanks to the enterprising commercial spirit of importers like Mr. Bellis, they are available at reasonable cost for the middle-class table and for invalids.

CARNINE SYRUP (Niemann's) is a meat juice obtained from raw beef by hydraulic pressure. It is rich in albuminoids, 4.312 per cent., and in phosphates, and consequently valuable as a dietetic for delicate persons and invalids, especially for those who from any cause are unable to take solid food; highly nutritious as well as palatable. The sugar in Niemann's Carnine Syrup is added as a preservative to prevent fermentation. Professor Liebig devised a process, forty years ago, for making a preparation, of which meat juice was the essential ingredient; but, according to Liebig's method, the extraction of the juice was effected by the agency of water at ice-cold temperature. This process was necessarily open to objection on the score of liability to dilution, and tendency to fermentation. It is claimed for Niemann's process that by it both of these sources of objection are effectually obviated.

CELERY COFFEE.—The umbelliferous plant, known as celery, and botanically styled *Apium graveolens* (the strong-smelling *Apium*) has long enjoyed a reputation as a wholesome vegetable, with beneficial properties as a dietetic for people suffering from gout or rheumatism. It is not obtainable in the fresh state at all seasons, and moreover, in that condition, it is apt to disagree with many persons of weak digestion. The inventors of celery coffee have brought out an excellent preparation of celery, which is both a useful addition to the table, and a dietetic beverage of value, even to those who cannot drink ordinary coffee.

MEDICAL ACHIEVEMENTS IN CHINA.—It is said of Dr. Kerr, a medical missionary at Canton, that he has, in the past thirty-six years, treated over 520,000 patients, and has prepared twenty-seven medical and surgical books. He has trained one hundred medical assistants, chiefly Chinese. China now possesses one hundred and four hospitals and dispensaries, at which, in 1889, more than 348,000 patients received treatment.

## Correspondence.

### SANITARY INSPECTORS AND THEIR SALARIES To the Editor of HYGIENE.

SIR,—I should like to draw attention to an advertisement of the Wood Green Local Board, which appeared in one of the weekly papers. They advertise for an assistant sanitary inspector, who must hold the certificate of the Sanitary Institute, to whom they offer a salary of thirty shillings per week. In the first place a man must have a good general education, considerable knowledge of building, plumbing, and kindred trades, and to carry out the duties imposed on him by the various sanitary acts, the Local Government Board, and his own local authority with any degree of success, he must be possessed of great tact and sound judgment. Then, to obtain the certificate of the Sanitary Institute, he must submit himself for an examination, to pass which he must have somewhat of the knowledge of a doctor, a lawyer, a veterinary surgeon, and a civil engineer, besides it costing many pounds for books, lectures, fees, etc. This certificate is the recognised qualification of the Local Government Board for sanitary inspectors, and to obtain a man with this combination of qualities the Wood Green Local Board are offering the above munificent salary, not nearly the wages of a good mechanic, barely equal to those of a labourer. Is it not time that the Local Government Board woke up the sanitary authorities to a sense of their duty in this respect? Is the salary sufficient to keep a man honest, in a responsible position where, it may be, he is often tempted to accept bribes to close his eyes to things that may be going on around him. No one wishes to see the rates any higher, but if we must have these officers let us at least pay sufficient salary to ensure them being above suspicion. We shall find it will be cheaper in the long run than heavy doctor's bills and a high rate to support the fever hospitals, the penalties of insanitary houses, which are sure to be found in districts where the local authority is under the impression it can get a man thoroughly competent in sanitary knowledge for 30s. per week.—Yours, etc.,

ASSOC. SAN. INST.

[We have frequently insisted upon the necessity and justice of paying adequate salaries to able inspectors. Some excellent observations on this subject will be found in a paper by Dr. Reid, M.O.H. for Staffordshire, on the Education, Training, and Status of Sanitary Inspectors, published in *HYGIENE* for December, 1891.]

THE UNITED STATES AS A FOOD-PRODUCING COUNTRY is regarded by most people as practically without limit, covering as they do a thousand million acres, or nearly twenty times the area of Great Britain; but, that such notions are erroneous is shown by the statements made in Mr. Wood Davis's pamphlet on the world's consumption and supply. Mr. Davis is firmly of opinion that within less than ten years the United States will cease to be a food-exporting country.



## Rotes and News.

PARAGUAYAN TEA is made from the leaves of a species of *ilex* (not the tea-plant), and, although not known in this country except as a curiosity, it is the most extensively used beverage in South America. Its active principle is a nitrogenous substance which corresponds with the caffeine of coffee and the thein of tea,\* and, like these, tends to arrest the rapid consumption of tissue, both by retarding decay and promoting renovation, thus relieving the feeling of exhaustion which is brought on by continuous mental or physical exertion. The mode in which the Paraguayans prepare the leaves is as follows:—The leaves are scorched and dried before they are separated from the branches brought in by the collectors; next, they are beaten, separated, coarsely ground by rude mills, and finally packed in skins or leather bags. The leaves are infused in boiling water in small teapots, and the infusion is taken by sucking it up through a bombilla, a tube with wire network or perforations at the lower end.

\* \* \*

MORPHIA INJECTIONS have killed thousands, and it is not likely that the mortality will diminish until the craze itself dies out. In former numbers of *HYGIENE* we have referred to the lamentable prevalence of this practice in Paris and elsewhere. Now, it is in full vogue in the United States. A physician, living at St. Louis, reports that in that city alone there are twenty thousand victims to the habit of injecting morphia under the skin, and that the great majority of them are women of the well-to-do classes.

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THERE ARE 163 DISTILLERIES in the United Kingdom, in the proportion of 124 in Scotland, 29 in Ireland, and 10 in England. Those in England and Ireland are, generally speaking, on a very much larger scale than the Scotch distilleries. The malt and raw grain consumed amount to nearly 3,000,000 quarters per annum; and 176,000 cwt. of molasses and 42,000 cwt. of rice are also used, in addition to large quantities of sugar and saccharine.

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A RIDICULOUS AND UNTENABLE EXCEPTION from the law relating to the compulsory notification of infectious diseases is that returns cannot be obtained by the local sanitary authorities of cases of infectious illness in military barracks, police stations, and prisons; as places belonging to the Government are exempt from the operation of the Act. Red-tape objects to returns being made of cases of scarlet fever, even when it is of the form which may be readily communicated to other persons, and not merely the silly admiration of nursemaids for the bright uniforms of the soldiers.

THE SANITARY CONGRESS AND HEALTH EXHIBITION, to be held this month at Portsmouth, under the auspices of the Sanitary Institute, will equal, if not even surpass, previous gatherings of a similar character. The place of meeting, Portsmouth, is well chosen, on account of its national importance, its population, its interesting surroundings, and the manifest desire of the local authorities to make it a success. The Health Exhibition will be held in the New Drill Hall from September 12th to October 8th, and will include an immense variety of sanitary apparatus and appliances and articles for domestic use. The President of the Congress will be Sir Charles Cameron, D.P.H., Medical Officer of Health for Dublin. The Local Committee and Executive Committee are especially strong, comprising the Mayor of Portsmouth, the aldermen and councillors of the borough, and many other persons of local and county position. The honorary local Secretaries are Mr. Alexander Hellard, Town Clerk, and Dr. Mumby, Medical Officer of Health, Portsmouth.

\* \* \*

PORTSMOUTH is not only a thriving and populous town, having grand associations with the past, but it continues to develop and improve. It consists of four townships, Portsmouth, Landport, Portsea, and Southsea. The population of "The Four Towns," as they were formerly styled—in a similar fashion, Chatham and Rochester were spoken of as "The Two Towns," and Plymouth, Devonport, and Plympton as "The Three Towns,"—is now 160,000, showing an increase of more than 30,000 during the past ten years. According to the Annual Summary of Births and Deaths in the twenty-eight largest English towns for 1891, Portsmouth had a lower death-rate, viz.:—19 per 1,000 of the population, than twenty-six out of that number, the only one lower than Portsmouth being Brighton, with a death-rate of 18·2 per 1,000. This condition of things is highly creditable to those who are concerned in preserving the public health of Portsmouth.

\* \* \*

IDLENESS AND LONG LIFE are not so closely connected as many people imagine. Dr. J. T. Arlidge, of Stoke-on-Trent, in his recent work entitled "The Hygiene, Diseases, and Mortality of Occupations," demonstrates that the mortality among the "unoccupied classes" is very heavy, particularly between the ages of 25 and 45. In fact, he shows that the rate of mortality in the highest ranks of society is in excess of that of the population at large.

\* \* \*

"IT IS BETTER TO WEAR AWAY THAN TO RUST AWAY," was a favourite expression of Charles Dickens, which gains weight from Dr. Arlidge's investigations; though in a different sense to that of the great novelist, who referred to the fact that one who "wears away" by honest labour, whether of body or brain, is a more valuable member of society than the drone who is content to "rust away."

\* See article on Tea and Coffee, *HYGIENE*, Vol. III., p. 51.

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## WATER SUPPLY.

By ALEXANDER R. BINNIE, M.I.C.E., Engineer-in-Chief, London County Council.

IN the forefront of our inquiries on the subject of a good water supply it cannot be denied that, however obtained and however treated from an engineering point of view, we must, in the first instance, secure a water of good quality and unimpeachable purity.

At first sight this may appear almost a truism, but, unfortunately, we do not find it to be either universally admitted or always observed in practice. For this we have to look to the great and almost general result of our modern modes of life and civilisation, which tend, more and more, to aggregate our population towards large centres of wealth and industry, and these, we observe, are generally situated on the banks of important rivers, or in river valleys not far distant from tributary streams. Not only are thickly-inhabited areas in themselves improper sources of water supply, but they are, also, directly the cause of pollution to the streams and rivers which flow through them. Consequently, we find many of the large towns of Great Britain which are governed by municipal corporations, such as Glasgow, Edinburgh, Lancaster, Manchester, Liverpool, Halifax, Bradford, Leeds, Belfast, Dublin, and many others, resorting at great expense to un-

cultivated and almost uninhabited tracts, and bringing the water from great distances so as to obtain a pure and uncontaminated supply.

When, therefore, we occasionally see large towns and cities which have not considered it necessary to take these precautions or to incur the consequent expense, but still continue to drink the waters of rivers largely polluted by the more or less clarified sewage and the manure of populous areas, we are led to ask ourselves the question whether the large expenditure of capital that has been made in certain cases, to obtain a pure water-supply, has not been an entire waste of our resources.

There can be little doubt that human beings can, for a considerable time, drink with impunity water largely contaminated with the excreta, both solid and fluid, of healthy persons; and that they are able to do so with impunity, and without loathing and disgust, appears to be due to ignorance and apathy on the part of the water consumers, and to the power which rivers possess of apparently destroying and veiling the more gross and palpable polluting substances. There are some persons, no doubt, who teach that running water has the power of entirely destroying sewage and other polluting matter which may pass into it; but there are few, let us hope, who would say that we can, with safety, drink water which has been polluted with the excreta of persons suffering from cholera, typhoid, small-pox, and



similar diseases; and yet this is practically the position taken up by those who advocate, unreservedly, the propriety of deriving supplies of drinking water from rivers on the banks of which, at no great distance, are situated large towns, for sooner or later we must expect epidemics to arise even under the most careful management.

Of two facts we may feel quite confident: first, that water subject to pollution is a very potent factor in the spread of disease; and, secondly, that there is perhaps no readier mode of introducing into the human system any substance which it can absorb, than by drinking it in the form of a solution. This being the case, it almost follows, as a natural consequence, that the utmost care should be taken to guard our supplies of drinking-water from contamination; and yet we see persons around us who shut their eyes to observed and well-known facts, and speak of the teaching of science and the experience of the world as sentiment, and who would continue to force upon a large number of their fellow creatures supplies of water contaminated with the excreta of millions of men and animals. That wells are frequent sources of death and disease, due to their contamination by house drains, is too patent to require a word of remark; and yet it required the cholera outbreak of 1849, and the deaths of some thousands of persons, to impress that fact on the people of London. And it appears to be forgotten that to drink river water polluted by sewage cost London in the cholera outbreaks of 1854 and 1866 the deaths of over 16,000 persons.

That people will go on for years drinking a supply contaminated by infiltration from graveyards, notwithstanding frequent warning, is proved by the outbreak of enteric fever at Cradley, in 1888, which caused 16 deaths in 113 cases.

The case of Lausen, in Switzerland, in 1872, proves that typhoid fever can be communicated by spring water flowing miles under ground

from a neighbouring valley. The cholera outbreak in Spain, in 1885, showed that, generally, the disease passed down the valleys, decimating the towns which drew their water from the rivers, but not affecting those which were independent of the rivers and had pure and uncontaminated supplies. In India the author has seen a town in which cholera had become endemic, almost entirely freed from that dire disease simply by giving up the water-supply derived from a populous drainage area and resorting to a purer and uncontaminated source. And the outbreak, two years ago, of enteric fever in the districts of Stockton, Middlesbrough, and Darlington, which derive their water-supply from the river Tees, proves that the germs of that disease are not destroyed either by filtration or in their passage for more than 13 miles down that river from Barnard Castle.

All these are cases in which chemical science is of little assistance, as it is powerless to detect the germs of disease; it can tell us of the presence of organic matter, but without a careful inquiry into the life-history of the water, it cannot pronounce that, under all circumstances, it is a safe and pure drinking water.

Nor from the experience of Valencia in 1885, and of Stockton and Middlesbrough, can we place much dependence on sand filtration, as an effectual preventive of disease; sand filtration may arrest the living germs, but is unable, apparently, to stop the passage of the minute spores from which they spring. The precipitation and clarification of sewage effluent by chemical agency, also, can hardly be relied upon, as it merely abstracts about one-fifth of the more solid impurity, leaving four-fifths of the dissolved organic matter to flow off into the river.

What, then, are we to expect from the continuance of supplies to large cities from sources so polluted, except that such cities may go on for years, perhaps, boasting of the chemical purity of their water and their low death-rate,

forgetting that the constitutions of their water consumers are being gradually prepared, by continually drinking small quantities of diluted sewage, to receive the germs of some violent epidemic which sooner or later will visit the sources of supply; and then will follow such an outbreak of disease and death as will cause consternation throughout the land.

### PHYSICAL INDICATIONS OF INJURIOUS SCHOOLING.\*

By OCTAVIUS STURGES, M.D., Physician to, and Lecturer on Medicine at, the Westminster Hospital; Physician to the Hospital for Sick Children.

THE object of this paper is to call attention to the movement disorder in school children, to describe the early signs of such disorder, and to offer some suggestions to aid teachers and parents how to discover it. The subject properly belongs to the hygiene of school life, and if it cannot be presented simply and without technicality to those whom it chiefly concerns, it is best left alone. It must be understood that my remarks are addressed to teachers and not to doctors, and that upon controverted questions of pathology and treatment I shall say nothing.

Now, the physical indications of injurious schooling are of many degrees, not all of them obvious to unskilled observers. The early restlessness of the little child under school difficulty is very apt, as I shall show, to be overlooked or misunderstood. As a consequence, it presently grows into the disorder known as St. Vitus' Dance. But it is not of the fully developed disease that I would now speak, except to show how it comes and how it may

be avoided. "Prevention is better than cure." The mental strain and consequent physical infirmity of school pressure it is easy to recognise, and easy to relieve.

Take a very common case as the pattern to start from. A thin, pale girl of eleven is brought to the hospital in consequence of continuous restless movements of the face and hands. These are now of such severity that the child has to be fed. This is her history:—The father is out of work, and in hospital; the mother has charge of chambers, but being rheumatic, cleaning out the place falls chiefly to the child; so does also running on errands in the evening, the season being mid-winter. These domestic cares require early rising and early work, while the night errands interfere with study and preparation for morning school. The child is sometimes late therefore, and her lessons are ill-learned. For these faults she is often "kept in" and "slapped." Presently the mother notices that the girl is restless at night, calling out in her sleep, and rambling about school work. So matters go on from day to day; the house drudgery, the school punishment, and longer hours, and finally, after an interval of errand-running, and the scanty meal of a child whose father is out of work, to bed and disturbing dreams until recalled (at 6 a.m. in winter) to the labours of another day. At length the limb movement and grimacing attract attention, and the mother in much alarm brings the child to a doctor.

Such and such-like is the common tale. During six months (November to May) I find forty cases of St. Vitus' Dance have been admitted to the Hospital for Sick Children. Nine may be selected as the best examples of that affection where school-bred. Their ages are between eight and twelve. *All but one are girls.* The exciting cause (in most instances long in operation) may be shortly defined as "school worry"; for instance, "bothered with lessons," "puzzling over sums" (a fruitful

\* A paper read at the International Congress of Hygiene. (Section IV.—Infancy, Childhood, and School Life.) Readers interested in this subject will find an article on "School Hygiene" in *HYGIENE* for September.



source of evil), "preparing for examination." In these cases the excitement and overwork attending examination is a conspicuous cause. Five of the children *were still kept at school after their restlessness had been noticed, and removed only when St. Vitus' Dance had developed so fully as to render them absolutely incapable of school work and sometimes even of speech.*

One example I will briefly quote to show the extreme sensitiveness of these children on the first access of movement disorder, a condition of nervous instability which demands notice no less than that of the limbs. This child had been working very hard for examination, and specially harassed by sums. She was in great apprehension about passing in arithmetic, and the overstrain had been so nicely timed that it culminated in obvious mismovement—actual dance of St. Vitus—just when the child was in for the first day's examination. Thus it happened that in the course of writing, her restless left elbow by misadventure jogged the right arm of a boy sitting next her, thereby, to her great grief, spoiling his paper, and at the same time producing such mental emotion as greatly aggravated her own disorder.

I repeat that the St. Vitus' Dance (or Chorea) of the doctor is but the final stage or full development of a disorder which potentially has long existed unnoticed. From its beginning to its end this disorder is self-aggravated; it grows out of material of its own providing. A child discovers, to her own surprise, that her limbs and body have passed out of her control. Neither hands, nor feet, nor tongue, are wholly obedient. And being a school child, and it being the way of the disorder to afflict the hands first and most, school work is made extra difficult. With all her pains, writing and summing are ill done; she reads indistinctly, writes badly, and is wanting in deportment. And when punishment follows, instead of sympathy, the child assents to it, in the knowledge, which her own small experience furnishes, that some penalty is the invariable

consequence of faults of this kind, but not without a vague sense of the world's injustice. Yet the affliction and the dread of punishment will not, as she foresees, make the day's work better done, but worse.

There is a continual falling off in lessons and a continual recurrence of penalty, until sooner or later (and it is sometimes very late) it occurs to some one wiser than the rest, that the child is not perverse, but ill.

I do not forget that school lessons are ill-done, not only from the hindrance of St. Vitus' Dance, but also, and still more, perhaps, from perversity, ill-temper, and distractions of many kinds. I would not have you continually suspecting St. Vitus' Dance. My object is to make you separate it, or rather its premonitions, as you most easily can, from other things that roughly imitate it.

Now, the way of St. Vitus' Dance when school made (or, let me say, of that movement disorder which, if unheeded, culminates in that affection) is commonly this. At first the temper deteriorates, the child gets petulant, fretful, and capricious. With this will often concur headache and restless nights. And if these signs are not read aright, and school work is not relaxed, there arises presently a certain restlessness of the face and limbs. Even this may be easily overlooked, because children are by nature restless both in mind and body. But if you are on the watch, and warned already by the change of temper, or the headache, or the bad nights, you will soon perceive that this over-movement is not *merely* childish restlessness. You will find, for instance, that it applies particularly to one part, or to one limb; that while there is a general want of control, this is expressed most in one place, and the *commonest place* (except the face and tongue) *is the hand.*

This infirmity of the hand gives rise of necessity to manual faults, which at first are almost invariably taken for a wilful disobedience to school rules and commands. Any one who

reflects how much of school work is hand work will feel for these poor children at the form which their visitation so often takes. It is easy to see how bad writing and untidy sums provoke scolding and slapping on the back; how these correctives in their turn increase infirmity, leading to worse writing and worse sums, until at length, by a self-acting process, the riot of the muscles becomes apparent, the child is put to bed, and its suffering ends.

The child's condition, I say, so long as the nature of it is unrecognised, is pitiable. Infirmity provokes punishment, and punishment aggravates infirmity. But I must add, speaking generally, that the child is not sorry for herself, nor resentful of injury. I suppose, indeed, that so long as the sums are being daily worked wrong, with daily slapping and "keeping in," while her schoolfellows, more observant than their teachers, ridicule her contortions and grimaces, life must be regarded as something of a burden; but I know, as a fact, that once delivered from this tyranny, the St. Vitus' Dance child is, as a rule, a cheerful amiable person, quite ready to see the ludicrous side of its own malady, very sensible to kindness, and soon cured by it. Once in bed and at rest, the rational treatment of its infirmity supplies as many aids to recovery in the way of sufferance, praise, and encouragement, as there have been before hindrances in punishment, extra work, and the belief on the part of the child (as I have known) that she is really "possessed."

You are to observe, then, that this disorder which school anxieties provoke, which goes on for a length of time unnoticed or else is put down to perversity, has, in fact, two distinct stages or, to speak more correctly, is looked at from two different points of view—the teacher's and the doctor's. At first, and at school, it is subjected to penal correction; and, at last, when by these means the disorder is fully developed, it is remitted to the doctor and given time for recovery. By a course of treatment which the

most malevolent design could not better contrive to that end, the overtaxed school child is converted into the helpless hospital patient. The case stands thus: when the disease is first called into life, when it has weak hold, and proper treatment provided on correct diagnosis (if I may use so large a word) would arrest its growth and nip it in the bud, it is supplied with the very food it wants for its development. At a later time, when fully grown, when no one can mistake it, and only time can cure it, it becomes a hospital "case," a fair text for comment on "modern school teaching."

Is there any remedy? Perhaps not. It is so difficult for any of us to enlarge by ever so little his accustomed range of observation. And, in my opinion, it would be better that the Dance of St. Vitus should be cultivated in schools, as most certainly it now is, than that teachers should be in constant dread of it, allowing faults and relaxing discipline on its account, seeing it where it was not, magnifying both its frequency and its peril. St. Vitus' Dance is after all a comparatively small matter, and the terror it inspires is groundless. Yet no one will deny that we should be better without it.

In conclusion, therefore, I would put in dogmatic form the substance of what has now been said regarding the causes, the subjects, and the usual premonitions of St. Vitus' Dance, together with certain physical tests by which injurious schooling may be detected and disease averted:—

1. Movement disorder is the product and the index of mental disturbance, and may be known by nice observation of the higher muscles (the face and hands) before it has reached the stage to which the term St. Vitus' Dance (or Chorea) properly applies.

2. When school children (and especially girls between 7 and 12, or thereabouts) alter in temper, work less well and less willingly than usual, get untidy or slovenly, in a word,



degenerate mentally and bodily—inquire of the mother as to the home conduct and temper. Ask particularly how the child sleeps, whether she complains of headache (or limb-ache), whether her food is sufficient.

3. Among the incidents of school life apt to be injurious in the way we are considering there stand out prominently examinations, moving into a higher class, sums (too difficult or ill-explained), punishment, and especially punishment or admonitions before schoolfellows.

4. The best index of muscular infirmity tending to St. Vitus' Dance is *the hand*. Face mobility may be mere nervousness, the tongue may be tremulous by nature. The hand test is infallible, and it is thus applied: Bid the child hold up both hands open, with extended arms, the palms towards you. If that is done steadily, both hands upright and both alike, no finger or thumb quivering, no falling back of either hand, nothing to choose between the positions of the two, then the child has not, nor is it near (either before or after) St. Vitus' Dance. You may confirm this test by another. Let the child place its open hands upon yours, palm to palm. Looking then at the backs of the child's hands, observe whether fingers and thumbs (especially the latter) repose naturally, without tremor and without restraint.

## SEWER AND DRAIN VENTILATION.

By R. READ, Assoc. M.I.C.E., M.S.I., City Surveyor, Gloucester.

*Introduction.*—A system of drains and sewers consists of a number of lengths, or branches, of underground pipes, of gradually increasing diameter and varying gradients, converging towards the lowest point or outfall of the system, where the sewage, more or less diluted, is discharged by gravitation.

The drains are the units of the system, and their total length is largely in excess of that of the sewers, with which they are connected.

The great majority of drains and sewers in a town consist of glazed stoneware pipes, and the remainder of brick or concrete culverts.

The flow through the drains is intermittent, but a sufficient number are always in use together to keep a continuous stream flowing through the sewers, but varying, both in volume and velocity, with the time of day, the amount of water supply, and rainfall. The fluctuations in the volume of sewage are frequent, the maximum flow in dry weather occurring between 9 a.m. and 2 p.m. when about half the daily water-supply of a town passes into the sewers; but rain may cause a sudden or gradual increase at any time.

*Sewer always full.*—The remaining space above the sewage in a drain or sewer is always filled with air, watery vapour, or gas, or a mixture of two or all of these.

*Minimum Velocity.*—In a sewer running half full, a minimum velocity of 180 feet per minute is necessary to prevent the deposit of solid sewage, unless special means of flushing are adopted to prevent it; but this velocity will discharge sewage at the outfall from any part of a town long before decomposition can take place. When solid deposit occurs in any drain or sewer, decomposition quickly ensues, and sewer gas, as distinguished from sewer air, is produced in increasing quantity, until the obstruction is removed.

*Compression and Expansion.*—Sewer air is alternately compressed and expanded against the crown of the sewer, by the rise and fall of the sewage, and also by the increase and decrease in barometric pressure; the latter action is particularly observable before a storm.

Watery vapour is constantly given off from the surface of the sewage, as from any other wet surface in contact with air; and both the watery vapour and sewer gases, if any are present, diffuse themselves throughout the sewer air, until the point of saturation is reached in an unventilated sewer. The percentage of moisture in the sewer air is lowered

by ventilation, and the more perfect the ventilation, the nearer the sewer air compares with the outer air.

*Temperature.*—The temperature of sewage and of sewer air is generally lower than that of the outer air during the summer, and higher during the winter.

*Forces at Work.*—Movements of sewer air are produced by compression, expansion, diffusion, differences of temperature, and barometric pressure. These movements cannot be measured by the anemometer, but are made visible by the condensing of the watery vapour in cold weather, or by the introduction of smoke.

*Down-hill Currents.*—A velocity of 180 feet per minute in the sewage will generally carry the sewer air downhill with it, and the movement is accelerated by every intermittent discharge from the drains.

*Wind.*—The most powerful agent in producing movements in the sewer air is the wind, which acts by inducing a vacuum in, or by blowing directly into, any opening in the sewers or drains, according to the position of the opening and the direction and force of the wind.

*Unventilated Sewers.*—All attempts to keep sewer air and gas bottled up within the sewers and drains having failed, ventilation was reluctantly adopted for want of something better; and it is now a generally recognised fact that unless some provision is made to ventilate sewers and drains, they will ventilate themselves in a dangerous manner.

*Earliest Ventilation.*—The first ventilation was most probably unintentional, by untrapped rain-water pipes, and by overflow pipes from rain-water cisterns becoming untrapped in dry weather, thus allowing the passage of sewer gas into houses.

*Street Gratings.*—To relieve the pressure upon sewers and drains, manholes, at long distances apart, were ventilated by open gratings at the street level, and these have been gradually increased in number and area

of openings, on the assumption that the nearer the approach to an open trench, the better; and now they are placed from 40 to 200 yards apart, while the openings range from 30 to 72 square inches in area.

This method of ventilation by gratings at the street level only, simply provides safety outlets, to prevent too great an accumulation of gas; but it is vent only, without ventilation, as the movements of the sewer air are very slow, feeble, and uncertain, unless there be a good wind, a rising barometer, and a fast running stream of sewage.

The differences in height between any pair of adjacent gratings at the street level is generally so small that there is no marked tendency for either to become an inlet, in preference to an outlet, and puffs of wind may make them act feebly both ways, during a few seconds, without greatly affecting the air within the sewer.

With a falling barometer the watery vapour and sewer air acting by expansion and diffusion rise out of the street gratings, and should there be decomposing deposit in the sewer, or in any drain connected with it, a nuisance will be apparent, for which the gratings will be blamed, although they only call attention to the existence of defects which they did not cause and can only partially remedy.

*Shafts carried above roofs.*—In consequence of complaints, the street gratings in some towns have been closed, and iron pipes, erected against buildings, substituted. This is still vent only, without ventilation, and a reproduction of the action of the street gratings at a higher level, without dealing with the first cause of the nuisance.

*Partial Ventilations.*—Neither of the above-named systems of venting to relieve internal pressure by partial ventilation, inducing a mere tendency to vacuum at the mouths of a number of outlets, whether at the street level, or above the roofs, can be anything more than a manufactory of gas, the currents of air having no power



to penetrate far beyond the mouths of the openings. At intervals, however, discharges of gas must take place, and the longer the interval the more dangerous the gas becomes.

The constantly changing conditions under which a system of sewers and drains act are such that it is as impossible to stop at partial ventilation, as it is to have no ventilation at all.

*Comparison with a Mine.*—The leading idea which for a long period governed attempts to ventilate sewers, was, that it was a similar problem to the ventilation of mines, whereas the conditions are entirely different. In a mine, all the air entering the down-cast shaft must traverse the workings and pass out through the up-cast shaft, these being the only two possible openings. But any attempt to draw air through a sewer will not be felt at a greater distance than 400 yards, and only under very favourable conditions will the distance exceed 100 or 200 yards. This was conclusively proved in 1858, by Sir Joseph Bazalgette and Col. Heywood, by experiments on a large scale, with a furnace at the Westminster clock tower.

*Wimbledon Experiments.*—More recently, in 1887-88, Mr. Santo Crimp, at Wimbledon, had 600 yards of 12-inch sewer trapped off at the lower end; an opening, of 28 inches area, was made at the street level just above the trap, and a 6-inch opening at the upper end, all other known openings being closed. There was a difference of level, of 100 feet, between the two openings, and a fan attached to the upper one drew air from the sewer at the rate of 300 cubic feet per minute for 14 hours, and during the same period the sewer air continuously discharged itself from the lower opening 600 yards away, at a velocity of from 42 to 104 lineal feet per minute, thus showing that one or more accidental openings must have existed, and that the friction of the flow of sewage, and the action of the wind, were sufficient to bring the sewer air down to the lower opening, in spite of the powerful fan at work at the upper end.

On removing the fan the 6-inch pipe was carried up a building 25 feet high, and anemometers attached to the lower opening showed than during 1888 the air current was downward at that point on 273 days, and upward on 97 days. Unfortunately no anemometer appears to have been used at the upper end of the shaft.

Notwithstanding these facts, the favourite recommendation made by newspaper correspondents has always been to connect with a factory chimney, on the assumption that it will entirely clear a whole system of sewers, and cremate the gases. Factory chimneys are usually confined to one quarter of a town, and although velocities from 500 feet to 2,000 feet per minute can be obtained by connecting with them—and in some towns costly stacks 100 feet high have been specially erected for the purpose—their effect upon ordinary sewers is only local, and very limited in extent; so that it is like shooting at a sparrow with a 100-ton gun.

*Keeling's "Destructor."*—The most recent apparatus for ventilating sewers by artificial means is Keeling's Patent Sewer Gas Destructor, an arrangement of lamp column with a 6-inch connection from the sewer for passing sewer air through an atmospheric gas-burner fixed in the base of the column, the outlet being about ten feet above ground, under an ordinary street gas-lamp, placed at the top of the column; a consumption of coal gas from six cubic feet to ten cubic feet per hour is required to keep them burning, and produces a heat of about 600° Fahr. at the burner, and about 100° Fahr. at the outlet, where the velocity is about 200 feet per minute, or equal to about 40 cubic feet of air extracted per minute.

The advantages claimed for this apparatus are that sewer gas is entirely cremated, and that one destructor will suffice to ventilate fabulous lengths of 12-inch sewer, variously stated, or inferred, as somewhere between 1,000 yards and nine miles; but no such distances can be affected by any such apparatus

if a fan, or a factory chimney, of ten times the power, cannot do it.

The apparatus costs about £15, fixed complete, and about £10 per annum for gas, and is a useful luxury as an aid to natural ventilation if properly applied at the lower end of a sewer, instead of at the upper end as recommended by the patentee.

Its greatest use is for dealing with the emanations from a very foul sewer; but this is treating the symptoms of the disease, instead of the disease itself, for such a sewer requires re-construction first, and ventilation afterwards.

*True Ventilation.*—Nearly all attempts to maintain a constant current of air flowing in one direction have failed because they have not been in harmony with the forces at work within and without the sewers. The streets are the only places where municipal authorities are free to ventilate sewers as they please; therefore, the gratings at the street level have always been more numerous than shafts above the houses; and so long as this is the case, no constant current of air inwards at the street gratings can be maintained. There can be no true ventilation without a system of both inlets and outlets; the street gratings should be comparatively small to always act as inlets, and the outlets should always be above the roofs of the houses, and much more numerous than the inlets. It is necessary therefore, in order to give a strong initial velocity at the inlets, and to localise the ventilation, that the street grating inlets should not exceed 30 or 36 square inches area, placed from 60 to 100 yards apart, and that the outlets should be distributed over these lengths in such numbers of 4-inch or 6-inch shafts that the sum of their sectional areas, between each pair of inlets, shall exceed the sectional area of the sewer as much as possible.

This arrangement can only be obtained by terminating every house drain by a 4-inch pipe, or 6-inch shaft, carried above the roof as an outlet, with no obstruction between it and the

sewer; the fresh air will then constantly enter at every street grating, with a minimum velocity of 100 to 200 feet per minute, travel down the sewer with the sewage, and up every drain and outlet pipe or shaft above the roofs. Each length of 60 or 100 yards of sewer between a pair of inlet gratings, and all the drains connected therewith, will then be thoroughly ventilated by a localised continuous current which cannot be reversed, and which will require no traps, flaps, valves, or other obstructions, except at the gullies and w.c.'s, to isolate or direct its course; the velocity of the current will only increase with the wind, from whatever quarter it may blow, and sewer gas will have no chance of existence.

*Interceptors.*—The above-described system requires the abolition of the so-called "Interceptor" traps, which obstruct the flow of the sewage, and render the true ventilation of the sewers impossible. They are the only form of unventilated syphon trap now tolerated, and oppose the inertia of about three gallons of stagnant sewage to each discharge through the drain; this sewage in the "Interceptor" never gets entirely changed, and is constantly manufacturing gas on its own account and thus constituting a greater danger to the inhabitants of the house than the sewer with which the drain so trapped is connected.

*Flushing.*—Every w.c. should be provided with a mechanical apparatus, or cistern, for flushing after every use, to keep the drains properly clean in the intervals between rain-falls, because the water so applied must of necessity pass through both drains and sewers, while whatever the quantity of water used by the municipal authorities for sewer flushing, it can only pass through the sewers, leaving the drains untouched, and thus wasting a large quantity of water which would be more usefully and economically employed if passed through the drains as well as the sewers.

*Object of Ventilation.*—The true object of sewer ventilation is not to let out at intervals



quantities of sewer gas of increasing foulness, but to introduce into properly-constructed sewers and drains such a constant current of air as will prevent the formation of sewer gas altogether.

The systems of partial ventilation now in use merely provide sufficient oxygen to facilitate the formation of gaseous compounds without rendering them harmless.

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## FRUIT.

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By DR. ALFRED J. H. CRESPI, of Wimborne, formerly Editor of the *Sanitary Review*.

THE earlier part of my life was passed in a small village a few miles from Birmingham. The house where I lived had large fruit gardens attached to it, besides a flower garden and a small paddock or two, and as I was the only child, and there was a good deal of fruit to which I had free access, it was only natural that the appetite for fruit, which, in common with all children, I possessed, should be so well developed by long indulgence, that, though childhood is past, no other food is so agreeable to me. When a very little boy I tried my hand, not at first successfully, at the cultivation of fruit, and during many leisure hours learnt something of this useful art. I was too young to understand the meaning of all that passed before me; but looking back on those distant days, I can recall many facts that would be of immense service to me were good fortune to put a large garden once more in my way. To some of these lessons I shall direct the reader's attention.

"Everything you see," said Archbishop San-croft to a friend who visited him in his garden, "is the work of my own hands, though I am bordering on eighty years of age." He had an old woman to weed, and a man to dig. "But for the nicer work," he continued, "I trust to no other hand but my own, so long, at least, as my own health will allow me to enjoy so

pleasing an occupation." There is no other road to success than this—patient, unwearying, intelligent application.

The importance of a constant and liberal fruit supply has not received the attention it deserves. Of late years much more land has been devoted to nursery gardens and orchards, and the yearly agricultural returns are satisfactory in showing the large increase going on in the area employed in this way. People are at last beginning to understand that the diet can be agreeably varied by the addition of a considerable amount of fruit, and there does seem a chance that more fruit will come into the markets of the great towns at any rate, partly from abroad and partly from our own country. It is a serious drawback, however, that small country towns and little villages, where fruit and vegetables might be looked for in abundance, are precisely those places where the fruit lover, unless rich enough to have a large garden—a most costly luxury by the way—must not live. In a recent September, at Gloucester, good plums sold at eighteenpence for seventy pounds, and greengages cost five shillings for the same quantity, while in Dorset prices were eight times as high for fruit of inferior quality. The railway companies, moreover, charge nearly prohibitive rates on fruit from the plum districts of Worcestershire, the carriage from Pershore to Wimborne (a large and important junction) actually amounting to three half-pence the pound.

The craving of children and grown-up people for fruit proves that it is man's natural food; and it is thought almost pardonable for school-boys to break into an orchard to get a few apples and pears. Few well-informed people will differ from me when I say that our homely bush fruits are among the most delicious, if they are not the most delicious fruits in the whole world. What can compare with the strawberry, the raspberry, large, luscious gooseberries, fine fleshy cherries, especially white hearts, white currants, well-ripened greengages,

nectarines, and peaches? Certainly not the insipid, spongy banana, the pomegranate, and the custard fruit. And yet, in spite of its wholesomeness, pleasant flavour, and tempting appearance, really good fruit is, taking the country at large, comparatively scarce and consequently dear. Why is this?

We must admit, I am afraid, that our climate is, to some extent, against us, and that, if our fruit is to succeed, it needs loving care and constant labour. As for apples, pears, and cherries, they are everywhere uncertain; one year you gather ten or twenty pounds from a tree which next year yields not one. In the northern and midland districts it is questionable whether any gardener ever found all his fruit crops successful in the same summer. Gardening is the most fascinating pursuit in the world when once a man has given his heart to it; if it were not so we should never be able to fight against the disappointments which too often attend it. We hope for good fortune this year and the next, and then we go on hoping again, putting in our seeds and plants, and looking forward with undiminished confidence to the perfect season that never comes. This uncertainty of return is one of the most serious drawbacks to extended fruit culture in England. Many a despairing cottager, worn out by cruel disappointment and severe foreign competition, consigns his fruit trees to the fire, and plants his gardens with potatoes, cabbages, or broccoli, which, though not so agreeable to the palate, are far more likely to yield a large return. In the South of England matters are different; and as the climate is there milder, the return is larger, and more to be depended on, and fruit cultivation is not attended with the same drawbacks.

The country cousin, who just at the right time wanders through the large market-halls of London, Birmingham, and Manchester, where the produce of the world is brought together for the benefit of the fortunate citizens, sees what fills him with envy—fruit

from all climates, of the most splendid description, and at prices of which he has no experience in his own neighbourhood. But what are the supplies of English markets compared with the inexhaustible abundance of Parisian ones at the same season; although French prices are hardly lower than ours. As for the American markets, the profusion there throws English and French abundance into the shade. To walk along a New York street on a dry, warm, sunny November morning, and pick out large, rosy, and thoroughly ripe apples from the vast mounds piled up on the street stalls, at one cent apiece, is a pleasure, the memory of which long remains to delight the traveller. The markets of Richmond, in Virginia, are even more attractive at that most beautiful season of the American year, but then they tell of proximity to and command of semi-tropical supplies that can never be brought to our shores unless at great expense.

We cannot hope to grow cheap fruit in the abundance I should like to see, at any rate in the North of England, but decided improvement on the present state of things is possible. With greater care in the selection of trees and with less ambitious gardening our fruit supply could in ten years be vastly increased. Let me explain my meaning. You go into the large gardens of Warwickshire, and what do you find? Numbers of pear, apple, cherry, and plum trees, which from the coldness of the climate, the pooriness of the soil, and sometimes from the kind of tree, bear little fruit. You find gardens overstocked with trees that cannot be remunerative. In our garden there were, on the walls of course, peach and nectarine trees and Channel Island pears. These trees were of little use and gave immense trouble. They sometimes blossomed freely, and then the walls had to be covered with large curtains moving on rods to protect them from night frosts. Six years out of seven a few miserable, half-ripe peaches and two or three dozen half-ripe pears were the only return. One summer



—the summer of 1855, I believe—the walls were one mass of rosy peaches, and that year I revelled in fruit which few persons would expect to grow in the open air so far north. Once more, in 1858, there was a fair return. Now, it happened that on a north wall of the house there was a plum tree, not carefully attended to, as it was not of a highly-prized kind, yet that tree was many times loaded with luscious fruit. In the well-kept but not always successful gardens of several neighbours there were plum trees which in warm summers were laden with fruit; but they also were fond of trying to grow rare fruits unsuited to the locality. Suppose that we had substituted plum trees that would bear for the expensive and troublesome pear and peach trees that gave so much trouble and brought so little profit, the result must have been, in the long run, an immense gain. Were I so fortunate as to have an acre of fruit garden, no foolish vanity would induce me to cover the ground with trees unsuitable to the soil and climate: quantity not less than quality should be my motto. Rather to my surprise several correspondents inform me that I am too hard on the climate of Worcestershire, or rather of the Quinton district. One tells me that apricots ripen at Aberdeen, and another adds that jargonelles are a common and successful Scotch pear. When I was a little child I often heard my Scotch schoolmaster say that Inverness was *the place* for fine, well-ripened fruit. Now I know that I am describing facts; and perhaps some of my critics prefer the fruit half ripe, like the worthy Scot, who thought Scotch outdoor grapes superb; but then, he added, he liked them hard and not over ripe.

Careful selection would do much. It is a mistake to suppose that trees can be acclimatised. Every species of plant bears a certain range of temperature, but it is impossible to extend that range. Many plants, originally placed in greenhouses, have done well exposed to the open air, and have been cited as instances

of acclimatisation. The truth is that these plants could bear a lower temperature and a greater range than was at first supposed, and it chanced that the natural climate of the locality suited them perfectly. The *Aucuba Japonica* is a case in point; so is the *Aponogeton Distachyum*, an aquatic from the Cape, which thrives in the open air at Edinburgh; so too with the *Araucaria Imbricata* from Chili, and some Nepaulese and Japanese plants, but the potato, the dahlia, the heliotrope, the Marvel of Peru, and the tobacco are as sensitive to frost as on the day of their first arrival in Britain. Lord Bute is trying to grow grapes in the open air at Castell Coch, near Cardiff, for wine-making. His experiment must fail, for the summer there is too short, and the mean temperature too low to make success possible, though the selection of hardy varieties of the vine and the maize might in time lead to a great extension of English agriculture. The same might be true of the peach, the pear, and the nectarine; hardy varieties of all three might possibly flourish very far north.

In the genial climate of the extreme south of England you find blunders similar to those of which we near Birmingham were guilty. Think of growing figs near Romsey, where the mean summer temperature cannot, in an ordinary season, exceed 62·0° Fahr. Fancy large walls covered with vines, bearing sour and small fruit rarely eatable. With a little greater common sense the sunny gardens of Hampshire and Dorset might be stocked with fruit trees that would do well: they should not have the best sites wasted in growing, or perhaps it would be more correct to say in trying to grow, grapes and figs. These two counties are fortunate in having warmer summers than farther north, and far more sunlight, but much of the land is a poor gravel or sand, and the orchards, which in many districts are small and neglected, are greatly inferior to the superb and far-spreading ones of Hereford, Worcester, Gloucester, Somerset, and Devon.

From what I have seen, it is certain that there is not a garden in England, Ireland, and Wales—of Scotland I know little—that might not be made fairly remunerative. But for this, two rules should be borne in mind—only to cultivate trees adapted to the climate and soil, and to select good sorts. Take currants, surely a very homely illustration. Black currants are not such prolific bearers as red or white ones, and are not such favourites at table; hence the former should largely give place to the latter, especially in small gardens. More important still, there are countless profitable varieties of red and white currants. You find trees that always bear well, and have ten, twelve and fourteen large berries on each bunch, while other kinds bear badly, and do not average more than six or eight small berries to the bunch. Why not exercise common sense in the matter, and choose sorts that can be counted on to do well? Look, again, at rhubarb. Is there a more profitable and wholesome vegetable? Rhubarb grows almost anywhere; even in a town garden ten or twelve large roots will flourish, and furnish stalks enough for a couple of pies a week for five months. Take gooseberries; how well they bear if care is taken to get good sorts: while, as for apples and pears, in the western and southern counties they are profitable and easily attended to, provided always care be taken to have good kinds.

The neglected appearance of many Hereford orchards does not do credit to the enterprise and intelligence of local farmers. The late Dr. Bull, of Hereford, whose labours in connection with the Herefordshire Pomona—one of the most splendid works on fruit culture ever given to the world—will not soon be forgotten, gave fruit-growing an impetus, the force of which is hardly yet exhausted. He impressed upon the neighbouring villagers the importance of selecting good kinds, of preparing the ground carefully, and of attending to the orchards systematically and thoroughly. Trees, while

still vigorous at the root, are often covered with lichens, American blight, and other parasitical growths that destroy all chance of a return, and which in time kill the tree outright. No plan is so simple and effectual as painting the whole tree carefully with paraffin, and in the following spring scraping the tree clean of the dead rubbish adhering to the bark; in a couple of years the tree, unless it has gone too far, thoroughly recovers; its bark becoming healthy again, and before long splendid crops of fruit repay the grower. Mr. Henry Dunster, a clergyman of considerable ability, has contributed an excellent and charming article on this subject to the *Nineteenth Century*.

An excellent man, a gardener, for whose sterling qualities and great shrewdness I retain great respect, had a favourite expression which he repeated a hundred times. It was, "Good sorts don't take up a bit more room than bad ones, and are less disappointing, and more profitable." Had I my way with the gardens of several friends I should grub up the old, badly-bearing fruit trees, and replace them with younger and better ones.

The fruit supply of this country must not be regarded as unimportant or as a mere luxury. Fruit might be eaten all the year round, and at nearly all meals, and might largely economise the meat consumption. An Arab will travel far on a pound or two of dates and a bottle of water. An Italian peasant will display herculean limbs and strength, and toil like a slave under a burning sun, on a few bunches of dried grapes, and a liberal supply of olive oil. The Parisians consume fruit and some kind of vegetables undreamt of in England. Why should we look upon fruit as a luxury when it ought to be a regular and large article of diet? Children as well as grown up people should take considerable quantities every day, and substitute it for other foods. Then it would play an important part in the food supply of the household, and, while improving the health, give



more pleasure to the eater than almost any other kind of food.

I am still comparatively young; yet, in horticulture, what vast improvements have been made since more than twenty years ago I first tried my youthful hand at gardening. We, at that time, paid a shilling apiece for strawberry roots that were a vast improvement on the older sorts, but which have in their turn been supplanted by better ones. As for prize gooseberries and grape currants, they were, in some rural districts, only to be seen in the gardens of the wealthy; now every enterprising villager can have them if he has a little energy and forethought. We were inordinately proud of gooseberries not weighing an ounce twenty years ago; now some of the Midland villages grow bushels of berries as large. The same is equally true of peas, beans, and other vegetables, in all of which unexampled improvement has been made. We had peas the pride of our simple hearts; but, talking to our old gardener some little time before his death, poor dear fellow! several years ago, about peas, he informed me that "them peas are no good now; we've got better sorts." He showed me beans eleven inches long, a dozen of which would make a dish. How unlike what I used to grow or see grown! Selection has been carried out with wisdom and prudence, and in a dozen years the art of horticulture has been revolutionised, and there is no limit to what careful gardening can accomplish.

Let me once more recommend my readers, however small their gardens, to grow a few fruit trees, and have some rhubarb plants, and in all cases good, profitable sorts, adapted to the climate, the soil, and the situation. Do not try, whatever friendly critics may suggest, to grow jargonelles, peaches, nectarines, and Marie Louises in Warwickshire and Staffordshire unless you can afford to have glass or some kind of efficient shelter. When you do your own gardening, and there is no great depth of soil, make a large and deep hole before planting your trees and

roots, and put in plenty of manure and good soil. In my garden at Edgbaston I dug large holes, a yard deep, for my rhubarb plants, and put in plenty of manure and light soil, and I did not forget to water the rhubarb roots thoroughly with liquid manure. The result was that three or four persons could almost have lived on the rhubarb I grew. Any trouble taken with a garden pays in improved health and in increased return; and industry and judgment can make five pounds of gooseberries grow where ignorance and idleness will not wring one pound.

I fear that fruit, looking at the trouble of growing it, is not so remunerative as some other kinds of garden produce; nor is it particularly nutritious, unless eaten in very large quantities. But then fruit is the wholesomest and most agreeable of foods, and when ripe cannot do harm. A small town garden might be made a constant source of innocent pleasure, and with intelligent management might grow more currants, gooseberries, and apples than most of my readers would believe possible.

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### THE LAW OF LONGEVITY.

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By NATHAN ALLEN, M.D., LL.D., formerly President, American Public Health Association.

(Continued from page 260.)

*Mental Hygiene.*—But there is still another class of facts differing from any of those mentioned, that has a powerful influence upon longevity, viz., the influence of the mind upon the body. Mental training, a well-balanced mind, a cheerful contented disposition, and temperate habits are, with rare exceptions, found indispensable. Now these pre-suppose a harmonious development of the whole body, and particularly of all parts of the brain. For it is impossible, we believe, to obtain the qualities here mentioned, in a high degree, without these two conditions. And the nearer this

development approaches that standard of organisation upon which is based the great law of longevity, the greater will be not only the aggregate amount of health, but the longer the duration of human life.

This interdependence of body and mind is becoming every year better understood. It is found that the relations of the mind to the body and of the various states and changes of physical organisation to the mind, have a powerful influence upon health. And the more marked and abnormal the differences in this relation, the more striking are the effects. If, then, health is so dependent upon the state and relation of these two agents, the duration of human life must be most sensibly affected by it. And we venture the assertion, that the more thoroughly this particular feature of the subject is investigated, the more important and far-reaching will be found the influence of these reciprocal relations. The evidences derived from this source will go far, we believe, towards proving that nature has established a certain harmony or equilibrium of action between the body and the mind, and the more perfect that development and the more harmonious the performance of their respective functions, the nearer is the approach to that standard of organisation upon which is based the law of longevity.

This view explains, in part, why the average age of man has been increased by education, and why the greatest longevity is found among nations most highly civilised. In confirmation of this remark, a distinguished writer says:—"That type of civilisation in which the efficiency of the community and of the individual is greatest, in which there is the most harmonious action between the body and the mind, the greatest happiness of the greatest number, the least excessive expenditure with the least luxury, where regularity and temperateness are innate characteristics, will be that state of civilisation most favourable to longevity." It is scarcely necessary to say that

such a type of civilisation could not exist without well-developed physical organisations generally, and a harmonious action of all the mental faculties.

Another well-known writer on this subject, after enumerating among the pre-requisites to longevity, temperate and regular habits, and a cheerful and contented disposition, says there must be not only an equilibrium of the mental faculties, but a descent from long-lived ancestors, a tranquil and happy temperament, and general symmetry of physical conformation with harmonious proportion of all the different parts and organs of the body.

Numerous quotations might be quoted from other authors, and many additional facts might be gathered from various sources in support of this theory of longevity; but our limits will not permit. Perhaps the theory of one writer should not be passed by unnoticed, inasmuch as it may be thought to have some resemblance to the one here presented.

*Theory of Mons. Flourens.*—Mons. Flourens, in a very elaborate treatise, maintained that man ought, by virtue of his natural constitution, to live to one hundred years, and that this natural term of life is abridged only by his own improvidence, follies, and excesses. He attempts to establish the length of human life by the law of growth and by analogy, viz., that every animal will live, on an average, five times the period of its growth. Thus, as it is found by anatomy that it takes, on an average, twenty years for man to reach his perfect growth, especially as regards the bony structure, the limit of life would be a hundred years. Flourens held that neither climate, nor food, nor race, nor any external condition had much to do with the duration of life, but that this depended almost wholly upon the natural constitution and the intrinsic vigour of all the organs of the body. But he does not define very clearly how this natural constitution is based upon the anatomy and physiology of the system, nor attempt to show what are its laws



and relations to the external world. We all know that climate, food, and other external agents have a powerful influence upon the development and preservation of the body. One great defect in his theory is, that he does not point out distinctly the great laws of health and life as based on physiology and external nature, which extend not only through individual existence, but are universal throughout creation. As to the question, "What is the natural period of human life, provided all the conditions are favourable?" perhaps he is not so much out of the way, though the testimony of most writers would place the limit somewhat less. Flourens gives us no standard of organisation as a perfect model, and upon which the great laws of health and life must be based. If we take into consideration the structure and functions of the human body—the design of existence, and its adaptation to external objects—there must be certain relations and fixed laws that govern in all these matters. For example, there is a fixed law that exists in the relation of pure air to the healthy functions of the lungs. It is so in reference to all other parts of the body. Now it is in the summing up of all these laws as applied to a perfect organisation, that we find the law of longevity. All the great laws of nature that are fixed and universal are invariably found based upon her works in a normal state, or in their most perfect development. As in painting and statuary the artist has constantly in his mind an ideal model, a typical standard which no living beings have ever reached, but only made approximations to, so in physiology it is easy to conceive a standard which represents an organisation in its highest state of development. It was with reference to making up and arranging the constituent elements which enter into such a standard that Professor Draper, one of the most profound physiologists in America, made this remarkable statement: "The approach to precision in these hypothetical constants will in all times be a measure of the exactness of physiology, and,

it may be added, also of the practice of medicine. The time is at hand when such a typical standard must be the starting-point for pathology; and no rational practice can exist without it. The passage of physiology from a speculative to a positive science, is the signal for a revolution in the practice of medicine."

(To be Continued.)

### THE DIETARY OF TROOPS: WITH SPECIAL REFERENCE TO VEGETARIANISM.\*

By LIEUT.-COLONEL A. T. WINTLE (late R.A.).

WE are justified in adopting as an axiom that the daily ration issued by the State to the soldier should be sufficient for the work he may be called on to perform, and should be provided at the least cost possible.

The present daily ration on home service consists of one pound of white bread and one pound of meat, exclusive of bone.

That this is not generally considered sufficient is proved by the fact that the soldier has to pay at least 3d. a day for extras of various sorts, *out of his own pocket*.

Is it possible to issue a ration sufficient for all requirements so as to save this personal expenditure, and without increasing the outlay on the part of the Government?

I think it is, if we go direct to the first source of food, viz.:—the vegetable kingdom, instead of obtaining it second-hand through the medium of animals.

Meat consists of about three-fourths of water. At 7½d. per lb. it will therefore cost about 2s. 6d. per lb. for dry food, while wheat and

\* The subject of the Dietary of Troops is so generally dealt with upon the usual lines of so-much meat, so-much bread, etc., that this paper, originally communicated to the Naval and Military Section of the International Congress of Hygiene, cannot fail to be of interest to our readers, as bearing on a dietetic question of public importance, though "Tommy Atkins" soon falls into the back-ground ("to the rear," so to speak).—ED. HYGIENE.

other grains, like beans, peas, etc., in their natural state contain only about 14 or 15 per cent. of water. One pound of these, at prices varying from  $1\frac{1}{2}$ d. to  $2\frac{1}{2}$ d. per lb., will cost only from  $1\frac{3}{4}$ d. to about 3d. per lb. for dry food; oatmeal, which has only about five per cent. of water, would be about the same price, and as it has been proved that the Canadian trappers thrive on a ration of  $2\frac{1}{2}$  lbs. of maize daily in a very cold climate, it will readily be seen that, as far as cost is concerned, the advantage is in favour of vegetable diet.

The next question to be considered is whether the soldier could perform all his duties on a purely vegetable diet?

Historians have told us that the Greeks, in the time of their early and most successful career, owed much of their physical strength and endurance to their simple diet of wheaten bread and other produce of the soil; their athletes when training were fed on dried figs, coarse bread, and soft cheese, and were absolutely forbidden to use wine. In later times, when animal food was given, it was soon found that it made them the most sluggish and stupid of men. The immortal Spartans were from infancy nourished on the simplest and coarsest vegetable food, Cyrus and his conquering army subsisted on vegetable food and water. The Roman army in the period of their greatest valour lived on a plain vegetable diet, and their athletes were trained on barley; and as the army became less temperate and simple in their diet, they became less brave and less successful in arms.

About the sixth century B.C., Confucius in China, Buddha in India, Zoroaster in Persia, Pythagoras in Greece, and Mauchopaca in Mexico founded their teachings on the basis of a non-flesh diet.

Travellers in more recent times have told us of the strength and robustness of the Egyptians; of the postal runners in India, in 1818, who used to travel from Bombay to Calcutta in 25 days, at the rate of 62 miles a day, their height being from 5 ft. 10 in. to 6 ft.; of the Chilian

miners, who used to carry loads 200 lbs. in weight up a perpendicular height of 80 yards 12 times a day; of the natives of Sierra Leone, living in a climate said to be the worst on earth, who are very temperate, and live as long as men in the most propitious climates; of the Turk,\* who has always proved himself to be endowed with singularly strong vitality and energy (as a member of a warlike race, he is without equal in Europe in health and hardiness; he can live and fight when soldiers of any other nationality would starve, and he can bear the greatest hardships and exist on the scantiest and simplest food; during the Crimean War it was found that his wounds healed much more readily than those of our men)—all these subsist on a vegetarian diet; of the Russians, some of them 80 and 90 years old, who worked 16 to 18 hours a day, and were full of agility, vivacity, and even hilarity, on a piece of black bread weighing about a pound, and a handful of garlic; of the Norwegians, whose general food is rye bread, milk, and cheese, who are remarkably robust and healthy, and live to a great age; of the Laplanders, who, living on flesh, are a diminutive race, while the Finns, *who are in the same climate*, but live chiefly on the products of the soil, are as fine a race as the Swedes and Norwegians.

Of the Syro-Arabian nations, Baron Larrey, chief physician of the French army in Egypt, under Napoleon Bonaparte, says: "The heads of this race display in other respects the greatest physical perfection, a most perfect development of all the internal organs, as well as of those which belong to the senses," and that experience has proved to him that their intellectual perfectibility is proportional to this higher development of physical organisation,

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\* Colonel Wintle refers here, of course, to the lower-class, unsophisticated Turk; not to the wretched, used-up denizen of large towns, ruined physically by excesses.—ED. HYGIENE.



and that it is, without doubt, superior to the faculties of those nations who inhabit the northern regions of the globe—i.e., the Europeans. "In Egypt," he says, "we have observed that young Arabs of both sexes imitate all the productions of our articles and artisans with astonishing fidelity, and that they also acquire languages with equal ease." . . . "They possess very white regular teeth; the canines especially project but little. We have noticed," he says, "first, that the convolutions of the brain, whose mass is in proportion to the cavity of the cranium, are more numerous, and the furrows which separate them are deeper, and the matter forming the organ is firmer than in other races; secondly, that the nervous system, proceeding from the medulla oblongata and the spinal cord, appears to be composed of nerves more dense in structure than are those of Europeans in general; thirdly, that the heart and arterial system display the most regularity, and a very perfect development; fourthly, that the external senses of the Arabs are exquisitely acute and remarkably perfect; their sight is most extensive in its range; they hear at very great distances, and can similarly perceive the most subtile odour." The muscular system is strongly marked; the fibres are of a very deep-red colour, firm and very elastic; hence the great agility of this people. "Upon the whole," observes Baron Larrey, "I am convinced that the cradle of the human family is to be found in the country of this race. They eat little, and seldom, of animal food."

The English seem always to have been the largest meat eaters, and when meat was sold at  $\frac{1}{2}$ d. per lb. in the reign of Henry VIII., according to Froude, "invariably by friend and enemy alike, the English are described as the fiercest people in all Europe (the English wild beasts, Benvenuto Cellini calls them)." In 1685 the majority of the nation lived almost entirely on rye, barley, and oats.

Adam Smith, in his "Wealth of Nations,"

1776, says that, "experience taught that grain and other vegetables, with the help of milk, cheese, butter or oil, afford the most plentiful, the most wholesome, the most nourishing, and the most invigorating diet," and that the men who did the hardest work in his time, as porters and coalheavers, were most of them from the Irish peasantry, while those who had continued their vegetable diet were the strongest men in the British dominions.

This has been confirmed by Dr. Forbes, of Edinburgh, who instituted some experiments with a view of testing the relative height, weight, and strength of 800 students aged about twenty-five years, and he found that the more carnivorous Englishman was surpassed in height, weight, and strength by the frugal and abstemious Scotchman, who, again, was surpassed by the simply-fed Irishman. Dr. Edward Smith found that our labouring population, and Dr. Guy that our soldiers in hospital, thrived in proportion to the cheapness of their food.

A report upon the alimentation of agricultural labourers in Europe, taken by order of the English Government about 1871, gives the dietaries in use amongst the working populations of various countries, and shows that the peasants and farm-labourers are almost wholly vegetarian in practice; in England alone do we find animal food forming part of the daily food of the lower classes, and this only within about the last 35 years, and already they are beginning to degenerate.

About two years ago the *Bicycling News* reported that, in a 24 hours' ride, the longest distance ridden on an ordinary bicycle was by a vegetarian.

In another instance, one who took honours at Cambridge has succeeded in doing 200 miles in one day on vegetarian diet, and trainers have already commenced advocating the same diet in preference to any other.

The celebrated Lord Heathfield, who defended Gibraltar in the siege, and who was well-known

for his hardy habits of military discipline, neither ate animal food nor drank wine; his constant diet being bread and vegetables, and his drink water, and he never slept more than four hours out of the twenty-four. Another well-known man was the eminent Army Surgeon Jackson, who said, "My health has been tried in all ways and climates, and by the aid of temperance and hard work I have worn out two armies in two wars, and could probably wear out another before my period of old age arrives. I eat no animal food, and drink no wine or malt liquors, nor spirits of any kind. I wear no flannel, and regard neither wind nor rain, heat nor cold, when business is in the way."

Benjamin Franklin concluded from trials that a vegetable diet promoted clearness of head and quickness of perception. He said, "The Irish boys are clever only so long as they are kept on the simple food of the peasantry, but become dull and stupid when fed on meat."

Newton wrote his great work on optics on a non-flesh diet.

Byron realised the effects of eating flesh, as regards brainwork, and is said to have written "Don Juan" on a mixed diet, and "Childe Harold" on a biscuit diet.

Shelley also practised, and wrote a powerful essay on the advantages of, a vegetable diet.

Count Rumford at the end of the last century conducted for a period of over five years the most exhaustive experiments that have ever been made as regards nutriment and cooking, in his attempt to discover the best way of feeding the poor of Munich. He found that the *cheapest, most savoury, and most nourishing* diet that could be provided, at a cost of a little over a penny a day, was a soup composed of pearl barley, peas, potatoes, cuttings of fine wheaten bread, vinegar, salt, and water, in certain proportions.

In the Parliamentary Report on Prison

Dietary, dated March 18th, 1878, the Committee in commenting on the outer envelopes of the seed of wheat remark that "they are all much *richer in nourishing properties, in nitrogen, oil, and mineral matters*, than the central or floury portions of the grain.\* The flesh-formers in white bread amount to seven or eight per cent.; in bread containing the envelopes they amount to ten per cent. Experiments have proved that animals can live upon brown bread without any other food; but, if fed upon white bread alone, their health suffers, and death finally ensues." The Committee quote Dr. Brinton as follows: "Brownish bread of simple wheatmeal, with even an admixture of a fourth or fifth of rye, would for equal money give the labouring population a food incomparably more nutritious than that which they now make use of as pure white bread." Then they state the estimated cost, at existing prices, of various articles of food required to give the strength necessary for raising ten stone to a height of 720,000 feet:—Split peas, 13s.; oatmeal, 14s. 6d.; flour, 18s.; bread, 18s.; cheese, £2 3s. 3d.; fish, £4 6s. 6d.; beef, £6. "We are of opinion," they remark, "that leguminous seeds or pulse should form a prominent feature of prison diets. The chief kinds of pulse are the pea, the haricot bean, and the lentil; these seeds possess a very high nutritious value. There would be no difficulty in constructing a dietary containing nutritious principles equal to those of meat out of oatmeal, peas, beans, and fats, and this could be done at a third or a fourth of the cost incurred by depending entirely upon the animal kingdom for alimentary products. Even at existing prices we would strongly recommend the frequent substitution of haricot beans and bacon for beef as a change."

They give the relative cost of the beef dinner

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\* On this and similar points the reader is referred to the article on "Various Kinds of Bread" in the September, and that on the "Dietetic Value of Bread" in the June, number of HYGIENE.



as provided in prisons, and of a bean dinner, as follows:—

#### BEEF DINNER.

|                                                   |                |
|---------------------------------------------------|----------------|
| 4 oz. of beef (cooked) without bone=7 oz.         | d.             |
| of beef with bone, at $7\frac{1}{2}$ d. per lb... | $3\frac{1}{2}$ |
| 12 oz. of potatoes...                             | $\frac{3}{4}$  |
| 8 oz. of bread ...                                | $\frac{1}{2}$  |
| Total ...                                         | $4\frac{3}{4}$ |

#### BEANS AND BACON DINNER.

|                               |                |
|-------------------------------|----------------|
| 9 oz. of haricot beans ...    | d.             |
| 1 oz. of cooked fat bacon ... | $\frac{1}{2}$  |
| 12 oz. of potatoes ...        | $\frac{3}{4}$  |
| 8 oz. of bread...             | $\frac{1}{2}$  |
| Total ...                     | $2\frac{1}{4}$ |

According to the Committee's report, the latter dinner is superior in nutritive value to the beef dinner, although its commercial value is only one-half.

Another point to be taken into consideration is the diseased state of so many of the cattle killed. Dr. Carpenter stated publicly a few years ago that eighty per cent. of the cattle that were slaughtered for the London market were diseased, and that the supply would fail if they were excluded. Is it possible for stalled animals, overburdened with fat, to be healthy under any conditions? Again, it seems necessary for all flesh-eaters to eat vegetables to counteract certain effects caused by eating meat. Inspector-General Dr. C. A. Gordon, writing on this point some years ago, said, "The importance of vegetables as part of the dietary of the soldier is much insisted on by the American Sanitary Commission," and he quoted the Commission as reporting: "We find in the absence of a vegetable diet a cause for the greater part of the mortality of our troops, both after the receipt of wounds and from disease, and we fully believe that one barrel of potatoes is, for the Government, equal to one man."

On the other hand, Dr. Carr, who, in 1847, wrote of the necessity of brown bread for digestion, nourishment, and sound health, and of the injurious effects of white bread, says: "Near the close of the last century, owing to a

scarcity of provisions, 80,000 English soldiers were fed on *meal* bread, and such were its effects that the officers and physicians of the army declared that the soldiers were never so healthy and robust, and that disease of every kind had almost disappeared from among them."

The only public institution that I know of where a vegetarian diet has been tried is the Boys' Home, Southwark, the superintendent of which wrote in June, 1889: "Our system of non-flesh diet has proved so successful that we never think for a moment of going back to the old *régime*. I am sure that, if wisely and thoughtfully introduced into any institution for young people, it will be found of advantage, both physically and morally. We have never had anything like such good health before as in the last three years. This is wonderful, considering the stock and antecedents of our boys."

Already vegetarian dishes have been introduced into the dietary of the troops at Aldershot, and have apparently given satisfaction; and if lectures were given to the troops showing the nutritive value of vegetable foods as compared with meat, they would be then prepared for the inevitable changes which will take place in the course of time.

### PUBLIC HEALTH REPORTS.

*St. James', Westminster.*—This West End parish, situated between Pall Mall on the south, Oxford Street and Hanover Square on the north, St. James' Street on the west, and Wardour Street at its eastern border, comprises an area of 164 acres. The resident population last year was ascertained to be 24,993, or less by 4,948 than it was at the 1881 census; still showing, however, an average of 152 persons per acre, owing mainly to the greater density of the population at the eastern portion of the parish. At first sight, the

falling off of the population of some of the London parishes is somewhat perplexing. The progressive decrease of the inhabitants of the parish of St. Luke, a typical East End parish, from 54,000 in 1871, to 42,000 at the last census, was noticed in the August number of *HYGIENE*; and a similar state of things exists in some other parts of the metropolis. The falling off, as regards St. James', is attributed partly to the demolition of closely-occupied houses for street improvements—notably, the formation of Shaftesbury Avenue—and partly to the circumstance that buildings formerly used for dwellings have been pulled down, and their places taken for the erection of warehouses and business premises.

In looking through the population tables of St. James's, as given in the annual report drawn up by Dr. James Edmunds, medical officer of the district, we note the close approximation in the numbers of males and females respectively—namely, 12,367 of the former to 12,626 of the latter. The mortality for the year 1891 was 493, equal to a death-rate of 19·73 per 1,000 per annum. The deaths from zymotic diseases during the twelve months amounted to 26, of which whooping cough was registered as the cause of death in 11, while the mortality from diarrhoea was 8; typhoid fever, 3; measles, 2; scarlet fever and diphtheria, 1 each; there were no deaths recorded from small pox or typhus. This is very satisfactory from a sanitary point of view.

The abstract of work done by the sanitary inspectors shows that they were vigilant and active, no less than 1,832 nuisances being either removed or abated. In addition, a large number of cases of infectious disease were visited, and measures adopted for removal, disinfection, and other preventive steps; while underground rooms or cellars were cleared of occupants in the poorer parts of the parish.

Dr. Edmunds holds the position of public analyst for St. James' as well as that of medical

officer of health. He reports that, during the past year, 60 samples were examined by him, under the provisions of the Sale of Food and Drugs Act, 1875, such samples having been procured by the Vestry officers, for the purpose of examination, viz., milk, butter, coffee, arrowroot, and water, with one of vinegar. Most of these were reported, after analysis, to be genuine; and none of them contained any poisonous ingredients. The report contains the following rather peculiar paragraph:—"No money or consideration other than the stipend paid by the Vestry has been received by me in connection with these analyses." This may have allusion to some ill-natured and (after the common rule of ill-natured) untrue remarks; or it may have reference to the circumstance that the stipend is disproportionate to the amount of laboratory work. Otherwise, though a public analyst should be, like Cæsar's wife, above suspicion, it seems unnecessary to be assertive on such a matter.

The Annual Report of the Vestry of St. James', for the year ending in March 25th, 1892, from which these particulars have been taken, is a compendious blue-book of 240 pages, containing a mass of useful and even interesting information concerning the parish—financial, educational, institutional, sanitary, and legal. Its completeness in other respects reflects great credit upon Mr. Harry Wilkins, the Vestry Clerk, who gives the full benefit of his professional knowledge as a barrister. His summary of the Public Health (London) Act, 1891, is excellent.

The Vestry of St. James' are evidently bent on moving with the times, unlike some bodies which appear stationary, or, if they display any activity at all, show it in a retrogressive direction. For example, they are strongly of opinion that the municipalisation of the Metropolitan Water Supply on the lines of last year's Metropolitan Water Supply Bill would be advantageous to the community. By the way, it is



interesting to mention in this connection, as illustrating the way in which London is at present parcelled out amongst the water companies, that no fewer than four, viz., the Chelsea, the New River, the Grand Junction, and the West Middlesex Companies supply the houses built on the 164 acres forming the area of St. James' parish.

We learn from this report that the last remaining slaughter-house in the parish of St. James' became disused last year, and that there is now neither slaughter-house nor cowshed within the Vestry's jurisdiction. It is often said in other kinds of notices, "please copy," and we would emphatically urge every other urban authority to "please copy" the worthy example of St. James' without delay. The bakehouses in the parish—33 in number—are frequently and regularly inspected by the sanitary officers of the Vestry; their condition has been satisfactory during the past twelve months, and it has not been found necessary to take proceedings against the occupiers of any premises of this description.

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### ITALIAN WINES.

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ITALY is one of the principal wine-producing countries in the world, yet its wines are comparatively unknown, even by name, to English consumers. In his beverages, as in his dishes, John Bull is too conservative, and the consequence is that he goes on, year after year, limiting himself to the same viands, and washing them down with the same fluids, with almost machine-like regularity. The words from Eliza Cook's poem, "It was my father's custom, and so it shall be mine," might truthfully be inscribed over the doorways of ninety-five per cent. of middle-class private dining rooms. The monotony of meals, arising from this blind conservatism, has been frequently commented on in the columns of *HYGIENE*; as Sir Henry Thompson graphically says, in his

book on "Food and Feeding," when describing the usual dinner in an average English household: "Joints of beef and mutton, of which we all know the very shape and changeless odours, follow each other with unvarying precision, six roast to one boiled." In the matter of wines, claret, port, and sherry, as in the days of our fathers and grandfathers, hold their own to the exclusion, in a large degree, of all other vintages; on special occasions a fourth being introduced, viz.:—champagne, then commonly spoken of as "sweet" and "dry," just as in older days, the only distinctions recognised were "pink" and "straw," according to the colour. It should be remembered, moreover, that port, sherry, and claret, are all, at the present time, particularly liable to different kinds of adulteration, including the most objectionable of all—fortifying with spirit, partly to augment the strength, and partly to conceal different adulterations. The ravages of the phylloxera and other causes have so much diminished the production of the French vineyards that France has to draw, to an increasing extent annually, upon Italy and Greece for the purpose of blending the wines of those countries so as to maintain the balance between demand and supply. Sensible people will naturally begin to ask the question, "Why should we buy through intermediaries that which can be procured in better quality and at lower prices direct from the country of its growth?"

"Good wine needs no bush," says the English proverb, referring to the custom which existed in olden times, before sign-boards were invented, of hanging a small bough, or bundle of twigs and leaves, over the doorway of a roadside house, to indicate that food and drink could be had within; the drift of the proverb being, of course, that superior accommodation and refreshments would of themselves constitute a sufficient attraction.

The Italian counterpart of this proverb is to be found in the national saying, "*Al buon vino*

non bisogna frasca," which would be more correct if English consumers were better acquainted with the wines of the Peninsula. But, beyond Chianti and Lagrima Curisti (which appears to be usually regarded as of Greek origin), the majority of Englishmen would be unable to name an Italian wine.

Mr. Egidiô Vitali is steadily doing for the wines of his native country what Max Greger did more than a quarter of a century ago, in the way of introducing Hungarian wines to English consumers. The numerous selected brands,—red, white, and sparkling,—enumerated in his list, indicate the variety of the Italian vintages, while a careful examination must convince the connoisseur as to their value.

Valtellina is a good, sound wine of the character of claret. Barolo, from Piedmont, is a clean-drinking beverage, full-bodied, with a delicate aroma, and slightly rough flavour, suggestive of the growth of the grapes from which it is made, in ferruginous soil. Capri, a white wine, from the South of Italy, is superior to most Sauternes in the market. The Marsala is a remarkable wine, particularly when its price (like that of the many other brands in the list, very reasonable) is taken into consideration. Falerno brings to mind, both in name and in excellence, the high praise bestowed on Falernian wine by the old Roman poets; one of whom, Virgil, an agriculturist as well as a poet, wrote: "You may as easily attempt to enumerate the sands of the seashore, as the different species of wines." This remark certainly savours somewhat of poetical licence; though it is an undoubted fact that the Romans, availing themselves of their favourable soil and climate, produced many kinds of wine of excellent character. Pliny, in his Natural History, narrates, with great minuteness, the processes involved in the manufacture of wine, and also states that out of 195 varieties known in his time nearly 100 were of superior quality, no less than two-thirds of the latter number being Italian. He further

mentions the interesting fact, of itself a sufficient proof of the perfection to which the art had been brought, that the Romans had wines which had been preserved for nearly 200 years, and were of great use, for the purpose of imparting flavour and body to vintages of more recent date.

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## Reviews and Notices of Books.

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*Cholera: Its Nature, Causes, Symptoms, and Treatment.* Being the Special (Extra) Number of HYGIENE. Price 3d. (by post, 4d.) Beaumont and Co., Limited, 39, Southampton Street, Strand, London.

THIS is a companion number to the one which appeared on the subject of Influenza, last year, when many thousands of persons fell victims to that disease.

It contains within a moderate space a large amount of information concerning cholera, of an interesting character, but especially so at the present time.

The history of cholera, from its origin to the epidemic now prevailing throughout greater part of Europe and threatening our own country, is carefully traced; and its causation also receives due attention, as well as the symptoms and treatment. All who have had practical experience of this dread and fatal affection will fully endorse the opinions expressed in this pamphlet that prevention is particularly to be aimed at, and that the stages—we had almost said the only stages—at which a cure can be attempted with reasonable hopes of success are the earlier ones, when the patient's strength has not become too much exhausted.

Many people seem to imagine that, because the cholera has, during the present European epidemic, been so far kept from obtaining a foothold in this country, we may conclude that we shall wholly escape. To rely too much upon this circumstance might possibly



be delusive and dangerous. We extract from the preface the following sensible remarks on this point:—"It is well to bear in mind that though the cholera has, so to speak, passed us by, and sped to the other side of the Atlantic, it has, like various other epidemics, a curious knack of turning up when least expected. Nor can even the most sanguine amongst us venture to assume that we are yet positively safe. The many thousands of persons coming from various parts of Europe may bring with them the germs of the disease: and the same thing may be said of the many thousands of tons of merchandise and food imported from European countries. Further, cholera, doubling back over the Atlantic, may enter our ports in ships sailing from the United States. Without any intention or desire to utter an alarmist note, it is therefore not altogether out of place for us to remind our readers that they ought not in any degree to relax their vigilance, or to neglect sanitary precautions as superfluous. To be 'forewarned is to be forearmed,' and to be forearmed will go a long way towards minimising the ravages and checking the spread of cholera, should it succeed in getting a firmer footing in this country, either now or later on."

## THE SANITARY CONGRESS.

THE thirteenth Congress of the Sanitary Institute was held at Portsmouth, extending from September 12th to the 16th. The attendance throughout was large, including well-known sanitarians from all parts of the kingdom, besides whom several foreign hygienists were present.

On September 12th a reception was held by the Mayor of Portsmouth (Alderman Scott Foster) at the Town Hall, where a luncheon was subsequently held. The inaugural address was delivered in the afternoon by Sir Charles A. Cameron, D.P.H., who succeeds Sir Thomas Crawford, K.C.B., M.D., in the presidential chair. Commencing with a graceful compliment to his predecessor, and with thanks to the mayor and other local gentlemen for the hearty reception which they had accorded, and the great assistance which they had rendered in the preparations for the Congress, Sir Charles proceeded to point out the

remarkable improvement which had taken place during the past fifty years in the health and comfort of the people. The Victorian era, he observed, was the age of sanitary and social reforms, of diminished sickness, of increased longevity, for never had the British people been so free, so happy, so rich, so powerful, so educated, so moral, so philanthropic, or so healthy. After enumerating the more important sanitary measures passed during the present reign, he said that until recently nothing worth boasting of had been done to improve the state of health in the open country, but the last Local Government Act had created for the rural districts sanitary organisations similar to those which had long existed in towns, and he hoped that the rural death rate of 17 per thousand would be reduced to 16 or less. He was proud, as a citizen of Dublin, to state that the example of the University of that city, which in 1865 created a diploma in State medicine, had been followed by all the other medical licensing bodies, so that there were now some hundreds of holders of sanitary qualifications. Before the Victorian era there were few sanitary laws worth administering, and consequently no *raison d'être* for local boards or officers of health. In 1831-2 there were 1,376 persons in England and Wales, and 21,171 in Ireland, who died from cholera. In 1848 cholera destroyed 53,273 lives. In 1853 20,000 deaths were ascribed to cholera, of which about half occurred in London. In 1866 cholera reappeared, but with less fatal results, the deaths in the British Isles being 18,149. This lessened mortality was not due to the milder character of the disease, but rather to the towns being less filthy than they were during previous visitations; for on the Continent, so virulent and widespread was cholera at this time, that it was computed it caused more than a million deaths. The cholera visitations of 1831 and 1849 awakened the public to the necessity of improving the hygienic conditions of towns, and he thought that in British towns generally Asiatic cholera would not again cause such ravages as it did in 1831, 1848, 1854, and 1866. He attributed much of the improvement in the public health to the substitution of mandatory for permissive legislation, and alluding to the study of bacteriology, said we had no institution which could be compared with the Pasteur Institute in Paris. The British Institute of Preventive Medicine established in 1890 proposed to found a bacteriological laboratory and accessories on a scale equivalent to that of the Pasteur Institute, and towards the hundred thousand pounds which they asked the public to subscribe they had received some handsome donations. During the Victorian era many millions of money had been expended in sanitary works, and he thought the result encouraged us to further outlay. Alluding to consumption, he said they must not be discouraged because of Koch's failure to kill the bacillus of tuberculosis, as in time they would be able to control its ravages, and perhaps to extirpate it altogether. It was evident from the fact that typhoid fever held its own, and was even increasing in many towns, that the

hygienic measures which had eliminated small-pox and typhus fever from so many towns had had little or no effect upon typhoid fever. He had made a careful study of the disease as it appeared in Dublin, and had come to the conclusion that it was earth-born. As a preventive they should keep the underground air from entering their dwellings, and should be as particular with respect to the purity of the soils under and close to their dwellings as they were with regard to the purity of the air that surrounded them. Let them keep corruption as far from them as possible, let them remember always that filth was synonymous with disease and death, and let them worship at the shrine of that goddess who had given a name to the noblest of sciences, for Hygeia was depicted as not only beautiful, but vigorous and typical of what the human form ought to be.

In the evening the Health Exhibition at the Drill Hall was formally opened by the Mayor, in the presence of a large gathering of persons interested.

On September 13th a Conference of Medical Officers of Health was held, Professor C. Kelly, M.D., in the chair. He opened the proceedings with some interesting details of the last census returns, and after some discussion it was resolved that a quinquennial census was desirable. Dr. J. Groves next read a paper on "Isolation Hospitals." During the past quarter of a century, he said, a great change has taken place in public opinion with reference to the relation of the individual to the community, more particularly in matters appertaining to the public health. Notification pointed out the spot at which poison was being generated, disinfection destroyed it; but isolation alone would render its production harmless. During the cholera epidemic in 1866 the great hospitals, supported for the most part by voluntary contributions, saved London. If the person generating poison was removed from the community he must be taken somewhere, and it was for the community, each individual ratepayer, to provide a place to which he could be taken. In nearly three-fourths of the provincial sanitary districts of England and Wales, however, this principle was not observed. The sanitary authorities of watering places and health resorts were particularly culpable in this matter. No payment should be accepted for treatment of patients, even if offered by wealthy persons, for by doing so the principle contended for would be destroyed, and the stigma of pauperism would attach to those who did not pay.

A paper, urging the desirability of compulsory reporting of cases of phthisis, was read by Dr. A. E. Harris, M.O.H. for Islington, but the majority of the meeting were not in favour of such a stringent measure, although they advocated greater precautions in the examination of milk and meat.

Dr. Wynter Blyth presided over the Conference of Sanitary Inspectors, held in the Victoria Hall. In the course of his remarks, the Chairman drew attention to the valuable work which the Sanitary Institute had done in establishing examinations of candidates for

the post of sanitary inspectors, the certificate of the Institute being the only one recognised by the Local Government Board.

A third meeting, namely, the Ladies' Conference, was also held on the same morning as the two which have been mentioned, Mrs. Ernest Day presiding. Miss Ethel Lamport, one of the lecturers connected with the Ladies' Sanitary Association, gave an address on "Food, with Special Relation to the Sick." Miss Lamport laid stress on the facts that food supplied to the sick need not necessarily be of an unpalatable or monotonous character, that patients should only have as much food as they could digest, and that in all febrile diseases the mouth should be cleansed with a non-poisonous disinfectant before taking food, the hands and face should be washed, and the patient made as cool and comfortable as possible. After some discussion Dr. J. P. Williams-Freeman read a paper on "The Chief Hygienic Causes of Mortality amongst Infants and Young Children." The chief causes of death in children under five years, he said, were diseases (1) of the respiratory system, (2) of the nervous system, (3) diarrhoea, and (4) whooping cough. Each cause was most active during the first year of infancy, and diminished with each successive year of life. Dr. Freeman cautioned those present against subjecting their children to sudden changes of temperature, and against unduly exciting their charges. Dr. Freeman expressed himself opposed to too early education of children, the age of five, or even six, years being quite soon enough to make any commencement in the way of systematic education.

At the conference of naval and military hygienists, Inspector-General of Hospitals John Macdonald presiding, Professor Stevenson, of Netley Military Hospital, read a paper on wounds produced by modern arms. He dealt exclusively with the rifle, and showed that wounds produced at very long range were so slight that men were only placed *hors de combat* for a very few days, whereas at short range the wounds were of very great severity. At Enfield some experiments with the Lee-Metford rifle upon a dead horse showed that the bullets acted as if they had been shells, whereas at a thousand yards the bullet made a clean hole through the breast bone and passed through the thigh bone without shattering it. The Lebel and Gras rifles produced effects which had been described as explosive on the tissues at short ranges, and from these experiments it became evident that the severity of the injury was in direct proportion to the velocity of the bullet and the amount of resistance it met with. In the Chilian war it was shown that the wounds produced by the Mannlicher rifles were of an exceptional nature, as they either killed the man outright or else insured recovery free from complication or excessive suffering. Recent experience had shown that while there would be a greater number of recoveries in future wars than hitherto, the number killed on the battlefield would be greater; and that though the work of the surgeon would be greater, the outlook would be more hopeful.



In the evening Sir Thomas Crawford delivered a lecture in the Town Hall, on "English Homes," Sir William King occupying the chair. The lecturer said that good work was being done in disseminating sound, practical knowledge of domestic and personal hygiene. Much, however, remained to be done before the general public could be brought to see the enormous waste in money, and the suffering and privation entailed upon the people, and most of all upon the poor, by the prevalence of preventable disease. Their homes ought to be considerably in advance of other nations. Were they? Streets and alleys in our more populous centres, which were the residences of the more cultured classes a century ago, had, in many instances, passed into the hands of the speculative rack-renter, to be let out as tenements; while, in not a few, whole districts of such tenements were daily swept away, either because they were no longer habitable, or because they were unsuited to the growing needs of an ever advancing civilisation. But taking our homes as they were, and applying to them the hygienic rules which they knew to be sound, and easily accessible to all, what must be, in too many instances, their verdict? Clearly there was still room for improvement in the best of them. Sunlight was a most important and essential element in regard to the salubrity, as well as the suitability of a house for residential purposes. No apartment was really fit for human habitation which was not freely traversed by sunlight, for the healthy growth was not attainable without a reasonable supply of that vivifying influence. A good water supply was an obvious necessity for every dwelling. The rapid increase of town populations, and the consequent ever-augmenting demands for a supply of this most essential requisite, had forced into prominence the question of water conservancy. In dealing with the ventilation of all apartments, and especially with day-rooms and dormitories, care should be taken to arrange the inlets for fresh and exits for foul air, so that draughts were not produced. In rooms lighted with gas, the need for an ample supply of fresh air and for the free escape of all products of combustion was still greater. There was a near prospect of improvement, for those who could afford it, in the electric light, but this would have to undergo further developments before it could be made generally applicable to domestic purposes at a reasonable cost. At present the tendencies of all classes who have to work for their living was to move into the towns, where higher incomes and social advantages were within reach; and it was only when repeated disappointments, terminating but too often in ruin and the poor-house, had opened their eyes, that the agricultural labourer and others so attracted recognised the mistake they had made. The causes of this were well known, but the remedies were not so clear. A movement in the right direction had been recently made by Parliament in the Public Health and Allotments Acts, but the remedy was doomed to failure in so far as the allotments provided were not within easy reach of the cottagers.

What was really required was a plot of ground round every agricultural labourer's and artisan's cottage, sufficient to enable him to utilise profitably his idle hours and broken time in the cultivation of garden produce for the use of his family. These changes could not come until the great landed proprietors saw the folly of letting the land only under conditions which made agricultural pursuits unremunerative. "General" Booth's scheme for the regeneration and salvation of the "submerged tenth" had this one great advantage over most other efforts of this class, in that he attempted to replace the unemployed on the soil under conditions which promised the honest and industrious cultivator health, food, and clothing, with a reasonable prospect of a useful life. But why not deal with the agricultural labourer before he left the land to become a town loafer suitable only for Salvation Army purposes? The growing neglect of mothers to nurse their own children was largely the cause of the mortality among infants under one year; while injudicious feeding must be regarded as an ever-present factor in the imperfect development and premature decay of large numbers of the human race. Another point on which he wished to lay emphasis was, not so much the injudicious selection of article suitable as food, as the impurity of the articles so selected. This was especially the case with milk, on which the young are so dependent. The penalties inflicted for such adulteration had done much to check the practice, but the scale of prices at which milk could still be purchased was conclusive evidence of the fact that to the poor at least, the article sold must have been largely diluted. The lecturer strongly advocated the formation of cookery classes for children, and of laundry classes, which would bring about a much-needed reform. The housing of the working classes was in a fair way of being satisfactorily provided for, but nothing had yet been done to provide suitable accommodation for the poorest class of the people not actually paupers. Many of them were infinitely worse off than the regular inmates of the Workhouse; but some element of self-respect, or pride it may be, constrained them to endure hardship and privation, even to the verge of starvation, rather than take that last, and to them irretrievable, step of going to the Workhouse. Let them be housed in homes in which they would be provided with those prime necessities, pure air, good water, light, and shelter, at rates which they could pay, while leaving a sufficient margin for food and clothing.

September 14th.—In the section devoted to preventive medicine, Prof. J. Lane Notter, M.A., M.D., communicated a paper on "Cholera." He observed that it might be laid down as an absolute rule in reference to cholera that its epidemic occurrence in any one place implied, beside importation of the contagion, certain local conditions, these being general sanitary defects, peculiarities of climate, and soil. The history of epidemics in India and in Europe taught them that unusually filthy surroundings accompany

outbreaks of cholera all over the world, and it could be readily understood why it was next to impossible to control an outbreak where such favourable conditions existed for the development of an epidemic after the importation of the seeds of the disease. This held good for cholera wherever it was met. To any one acquainted with Eastern habits, it was easy to conceive how any infectious disease was conveyable by water, or by milk adulterated with it. Wherever there had been a recurrence of cholera, the same monotonous conditions existed, revolting contamination of the drinking water and utter negligence in the disposal of excrementitious matters. They in England trusted to sanitary measures for protection against the invader, but they had to ask the questions—Were they safe in depending on such means of protection as they had as yet enforced? Had they no unhealthy quarters in their crowded cities which the mass of the population resort to for labour, and for the excitement incidental to city life? Had they no defects in their drainage systems and methods of removal of animal waste? Was their water supply above suspicion? Was not the aggregation of human beings on limited areas a source of danger, and especially so when among those were numbered the dissolute, the loafers, the street arabs, and casuals, who congregated in certain quarters and huddled together in foul rooms—unfortunates who could not escape the results of their physical organisation? If such were the case, were those who were officially responsible for watching over the public health doing all they ought to do to afford them protection? They had abolished quarantine—as he thought, wisely—and had thrown the gates open to every invader. Could they prove that they might rely on such measures, and that there were no weak points in their sanitary administrations? There could be no doubt that a relatively high temperature favoured the production of cholera. Warmth, and up to a certain degree, moisture were the physical conditions which, combined, above all others fostered the development of the specific poison. From the earliest records of the disease a remarkable fact has been noted, viz, that cholera had always attained its widest diffusion and its greatest intensity in those localities which were distinguished by a certain physical soil character—permeability to water and air, and on those kinds of rocks which had a large capacity for retaining the moisture which had fallen upon them. A careful analysis of the writings of Lewis, Cunningham, Pettenkofer, and others, based on evidence gathered partly from the endemic home of cholera in Lower Bengal and other parts of India, indicated that the only soil states which appeared to bear any constancy to cholera were porosity and permeability; an average soil heat of 79 degrees Fahrenheit, at six feet, and a low level of the subsoil water. In the endemic area the soil was probably the main, if not the essential site of the processes and changes resulting in the production of the poison which in man induced

cholera. The soil concerned in those changes was, in all likelihood, that layer lying above the water-level, with the first impermeable stratum in a locality; and once seeded with the specific organisms, the developments in the soil or diffusion from the soil depended on certain conditions of that layer. The soil appeared to play a direct part in the production and diffusion of cholera in the endemic area. Outside this area the soil strata appeared to have nothing whatever to do with the disease; its appearance there was due to importation of the virus, and its diffusion as an epidemic to sanitary defects. Soil and climate alone had not been observed to originate the disease in non-endemic areas.

“Does Consumption Arise from Flesh Eating?” was the question propounded in Mr. J. Oldfield’s paper. He remarked that diseases were produced in a variety of ways, the chief being by the inhalation of disease germs into the lungs, and conveyed thence into the circulation, and by the ingestion of disease germs with the food, thus passing into the stomach and subsequently carried through the medium of the blood into all parts of the body. In this last-named way Mr. Oldfield believed that the seeds of tuberculosis were sown, through eating tuberculosed meat, very much more common than is generally supposed, and difficult of detection by ordinary means of observation.—Sir Charles Cameron, in opening the discussion, said that Mr. Oldfield, in his desire to advance the cause of vegetarianism, had considerably exaggerated the dangers arising from eating flesh, and argued that the true remedy for tuberculosed meat consisted in the abolition of private slaughterhouses, and the establishment of public abattoirs under the control of the municipality.—Dr. Arnold Luthen urged that the danger of infection by tuberculosis existed in a far greater degree in the case of milk as a food, than in that of meat; and Sir Thomas Crawford suggested that these terrible diseases might be best combated by plenty of fresh air in living-rooms and sleeping apartments.—Dr. Sykes and Dr. Thresh also took part in the discussion.—Veterinary-Captain F. Smith, M.R.C.V.S., of the Army Veterinary School, Aldershot, read a paper on “How long does vaccination confer immunity against small-pox?” His statistics, derived from the returns rendered to the Army Vaccine Institute, of which he had the charge, went to show that primary vaccination furnished insufficient protection, and that revaccination was a necessity. After some discussion, in which the speakers upheld this view, a resolution was passed, advocating the removal of the control of vaccination arrangements from Boards of Guardians, and placing them in the hands of the Sanitary Authorities.

A conversazione was given in the evening, at the Town Hall, by the Mayor and Mayoress. It was largely attended, upwards of 1,000 guests having accepted invitations, and a varied round of amusements was provided, terminating with a ball.

September 15th.—In the section of Preventive Medicine a paper was read for Dr. J. Wright Mason



M.O.H., for Hull, on the "Sanitary Influences of Harbours and Exposed Foreshores." Dr. Mason's absence was explained by the circumstance that as Hull was in direct communication with Hamburg, he was unable to leave his post. In his paper he recommended as preventive measures against cholera that all ships arriving from abroad should be carefully examined, and that quarantine should be compulsory for all ships having infectious diseases on board. At the same time there should be great care as regards sanitary arrangements ashore, and especially as to the water used for drinking and culinary purposes.—Professor Lane Notter, the President of the section, said that the weakest link in the line of defence against cholera was that it would be next to an impossibility for poor sanitary authorities to go to the expense of erecting infectious hospitals. Along the shore the charges for such establishments should be Imperial, and not thrown upon the localities solely.

In the engineering and architectural section, Mr. James Lemon, C.E., Mayor of Southampton, pointed out in his opening address that to resist an attack of cholera they must have good sewage, good house drainage, a pure water supply, and plenty of air space. The prevalence of cholera at Hamburg and Havre was an illustration of this fact, for at Hamburg the houses were built contrary to all rules of sanitation. In 1884 he was called in to report on the sewage of Havre, where the normal death-rate was double that of Portsmouth. The authorities engaged a committee of experts to consider his report, but nothing had since been done. No man should take a house unless he satisfied himself of its sanitary condition, and if the owner refused to go to the expense of an examination, it was evidence that he was not prepared to put the building to a proper test. As the architect and engineer did their work well, so would the duties of medical officers and sanitary inspectors decrease.—Mr. Henry Law, M.I.C.E., contributed a paper on "Apparatus for Softening Water." Water, he observed, could be softened by boiling, by distillation, by exposure, by freezing, by filtration, and by chemical reaction. It was of this last process that the paper treated. The process which had been most extensively adopted was the addition of a certain quantity of lime to the water to be softened. It was important that the lime should be put into the vessel first and the hard water gradually added, because there was thus an excess of lime present up to the very close of the process. The insoluble compound resulting from the chemical re-action could be removed by subsidence or precipitation or by filtration. Mr. Hubert L. Terry, F.I.C., contributed a paper on "The Smoke Clauses of the Public Health Act, 1875." The state of the atmosphere in our large cities, said Mr. Terry, was a subject fraught with interest to the sanitary reformers of this country, and it seemed to be generally felt that smoke was a nuisance, and that black smoke in particular was the incarnation of evil. The Legislature chiefly concerned itself only with black smoke as evolved from factories and workshops,

but there was a growing conviction amongst those who had gone into the matter that grey smoke of the household grate was really a more deleterious product, as it consisted largely of hydro-carbons, more injurious to organisms than was free carbon. He submitted, informally, that local authorities should acknowledge the special applicability of the saving clause to Section 91, Sub-section 7, Public Health Act, 1875, to chemical works, and that where the smoke clauses were enforced the inspector should be a chemical engineer or other person competent to carry out the spirit of the Act.

In the evening the annual dinner of the Sanitary Congress was held at the Town Hall. The President of the Sanitary Institute, Sir Charles Cameron, was in the chair, and was supported by the Mayor of Portsmouth, the Mayor of Southampton, Sir Thomas Crawford, Sir Wm. King, General Grant, and a large company of local gentlemen, as well as visitors to the Congress.

Sept. 16th.—Three papers were read before the Congress, having reference to Sewage and its disposal. These were:—"The Treatment of Sewage," by Mr. E. E. Scruby; "Notes on Sewage Treatment," by Mr. C. H. Cooper, Assoc. M.Inst.C.E.; and "The Treatment and Disposal of Sewage Sludge," by Mr. Arthur Angell, Public Analyst for Southampton. The first-named described a novel method of dealing with sewage, so as to insure an innocuous effluent. A full account of it will be found in *HYGIENE*, vol. IV., number 44. Its essential character and special novelty consist in passing the liquid sewage through a chamber which contains pure oxygen. After the solids have been precipitated, the fluid portion of the sewage is subjected to a process of filtration, and next conveyed into an air-tight chamber charged with oxygen. The water falls on a ribbed cone thus causing its subdivision; afterwards it passes through a perforated plate, insuring further subdivision—a process which can be repeated if thought desirable. By means of this subdivision, oxydation becomes an absolute certainty. Three valuable and remarkable results are obtained, as the bad smell of the effluent is removed, germination is prevented, and microbes are destroyed by the oxygen. It is an interesting fact that the sewage effluent water which has been submitted to Scruby's process will keep in bottle for a much longer period than soft water would do. We should mention that the solid portion of the sewage (about three per cent. of the whole) is treated with burnt limestone, which renders it perfectly harmless. The cost of production of the oxygen is regulated by the price of materials, and ranges from 5s. per 1,000 cubic feet upwards. This would mean £40 per annum per 1,000 population, or 8d. per head only. It would be well worth the while of all sanitary authorities—and they are very numerous—having difficulties as regards the disposal of their sewage effluent, to make themselves acquainted with Mr. Scruby's method, and to give it a practical trial. In the case of the metropolis, for instance, although an

eminent engineer reported to the London County Council last year on the impossibility of dealing satisfactorily with the metropolitan sewage, Scruby's method could be advantageously adopted at the present outfall.

Mr. Cooper, in his "Notes on Sewage Treatment," divided his subject into three classes:—

1. Natural treatment by irrigation and filtration, in which purification is effected by nitrification.
2. Electrical treatment, by means of electrolysis, coupled with salts of iron electrodes.
3. Chemical treatment, in which, by the addition of various chemicals, the organic matter is removed in the form of a precipitate.

Subsequent purification of the effluent is, however, retarded by this process. The term "natural treatment" he applied to that effected by micro-organisms in the ground and filters. By taking advantage of the method of treatment afforded by nature, it would appear that the health of the surrounding district was rather benefited than otherwise; thus, on the sewage farms competing for the City of London's prize offered in 1880, the death-rate was only four per 1,000. In the case of treatment by electricity or chemicals, mechanical separation of the solids form an essential part of the process, the separation being effected by settling-tanks, filters, or to a small extent, by screens. It is now generally admitted that chemical treatment of itself cannot give a satisfactory effluent, still there is considerable misconception as to the amount of purification that may be effected by chemical means. The result of experiments made by the Massachusetts State Board of Health shows a removal of about 50 per cent. more albuminoid ammonia and about the same percentage of combustible matter at a cost of .19 of a dollar over mean settling of sewage. This appears to be a poor return for the outlay, but on the other hand the chemicals act as deodorants, and by so doing retard decomposition.

In his communication Mr. Arthur Angell pointed out the evils resulting from the fermentation in the sewers through the discharge into them of brewery refuse, and strongly recommended that all brewers should be required to treat such liquid residue in subsiding tanks until the greater part of the solid matter had become separated by gravitation. He gave an account of a plan for making hydraulic cement from pressed sewage, sludge cake, and waste gas-lime. Samples of this cement which he exhibited had withstood a tensile strain of 293 lbs. to the square inch.

In the section devoted to Chemistry, Meteorology, and Geology, the president of the section, Dr. W. J. Russell, F.R.S., took for his introductory address the subject of the "Chemical History of the Air." Having given a *resumé* of the history of chemical research into the composition and qualities of the air he said it had been clearly established that however accurate the determination of oxygen might be it did not tell them what the wholesomeness of the air was, but it had told them that in free air there was

always very nearly the same amount of oxygen. Ozone very probably was always present in normal air, but, unfortunately, they had no accurate method of determining its presence. Its formation probably arose from electrical action, and, directly, or indirectly, from evaporation. It was said that the quantity present in the air was greatest in spring, and gradually diminished till the winter, when it was least, and that it was more plentiful in wet than in fine weather. As to solid floating matter in the atmosphere, it was every day becoming of greater and greater interest. Volcanic eruptions added from time to time their contribution of small solid particles, the sea was continually adding in the way of finely-divided solid salts, and they could not ride, or walk, or carry on any mechanical operations without adding dust to the air. Mr. Aitken had given vital interest and importance to this subject, for he said that if there were no dust in the air there would be no fogs, no clouds, no mists, and no rain. He had proved that with a difference of four degrees shown by the thermometer and only 500 particles of dust in the cubic centimetre the air was clear; with 814 particles it was medium, but with 1,900 particles it was thick. Had the dust particles been entirely absent no amount of increase in the humidity of the air would have interfered with its transparency. Mr. Aitken had shown how to count the finest particles of dust which existed in the air. They were further indebted to Mr. Aitken for devising a small instrument, the *koniscope*, for testing rapidly and easily the air in our cities and rooms—an instrument which the sanitary inspector would find of use. He (the President) believed it had been satisfactorily proved that great epidemics, such as cholera, plague, yellow fever, and influenza, were not spread in their ordinary course by the air, and that from careful observation it had been shown that they did not travel faster than human intercourse; and they might be thankful that such was the case, for from our present imperfect knowledge it would have been readily conceivable that the causes of such pestilence might have been wafted for long distances, and have dwelt with the aqueous surroundings for a long time in the air, to have been precipitated at any moment on any part of the earth above which a sudden and sharp condensation arose.

A paper was communicated by the Hon. F. A. Rollo Russell, on "Exhalations of Vapours from the Earth." The experiments detailed by the author showed that the interior of inverted vessels placed on the ground was much more heavily covered with dew than the exterior, that a great quantity of vapour issued from the earth, even in dry weather and when the surface was dry, and that the maximum condensation on exposed objects appeared to take place in the hours of the early morning in dry weather. In summer about half, and at other times of the year a large proportion of the dew formed was condensed vapour from the ground. The vapour discharged at night through an upper layer of dry garden soil was very much less than through dry sand. During changeable



weather it was noted that the wetness of the surface soil exercised a great influence on the formation of dew, and that much vapour was emitted at night.

Two other papers of a geological character were sent, both by Mr. W. Whitaker, F.R.S., F.G.S., the one relative to the area of chalk available for water supply in the central and eastern parts of the London Basin, the paper being illustrated with the aid of a number of valuable maps, the making of which had extended over eight years; the other paper being entitled, "Local Geology from a Sanitary Standpoint," and dealing with the Portsmouth water supply.

The Congress was brought to a close on the evening of September 16th by the delivery of a public address—subject: "Full of Days"—by Prof. Corfield, M.D., in the Town Hall. The chair was occupied by the Mayor of Portsmouth, and the excellent lecture was attentively listened to by a large and interested audience.

From the foregoing report it will be seen that the numerous papers read were of a high character, and we purpose to publish some of them at greater length in future numbers.

The Health Exhibition, held concurrently with the Congress, and under the auspices of the Sanitary Institute, has now become a most important feature of the Annual gathering. It is held this year in the Drill Hall, Portsmouth, and will continue open until October 8th. We recommend those of our readers who have not visited the Exhibition, to avail themselves of an opportunity, should one occur. The exhibits are not only numerous, but are of remarkable excellence and variety, while not a few present features of considerable novelty. Our present space will not allow of any detailed account of them. Some have already, however, received notice in our columns, and we intend to give a description of the most meritorious in subsequent issues of *HYGIENE*.

### HYGIENIC NOTICES.

**THE PNEUMOSTHENE.**—The object of this apparatus is to regulate the respiration in such a manner that, while the act of inspiration fills and expands the lungs and their air-cells to the completest extent, the expiration, or emptying the air from the lungs, is prolonged. As a consequence of the regular use of the Pneumosthene, three important results are obtained:—1. The lungs are fully expanded, as has already been stated. 2. All the air-cells are filled with a new supply of air. 3. The muscles of the chest are strengthened and developed. For these

reasons the Pneumosthene will be found very beneficial for persons with weak lungs, for young growing people, and for all who have contracted chests or stooping shoulders; in fact, for every one in whom the respiratory functions are inadequately performed. We have seen some remarkable instances of the value of the Pneumosthene in cases of this kind. We should add that the sole London agents are Beaumont and Co. (Limited), of 39, Southampton Street, Strand, W.C., and that the low price at which it is produced brings the Pneumosthene within the reach of all.

### DIETETIC NOTICES.

*Godes-berger.*—This is a natural sparkling mineral water, which flows from a spring bearing that name, and situated near the ancient castle of Godesberg, opposite the Seven Mountains of the Rhine. For many hundreds of years this spring has been held in great esteem on account of the excellence and the purity of its water; the earliest known record of it dates back as far as the 13th century. The following is the analysis made by Prof. Redwood:—

|                           |         |                    |
|---------------------------|---------|--------------------|
| Carbonate of Soda ... ..  | 47.60   | grains per gallon. |
| Sulphate of Soda ... ..   | 15.75   | " "                |
| " of Potassa ... ..       | 1.23    | " "                |
| Chloride of Sodium ... .. | 34.65   | " "                |
| Carbonate of Iron ... ..  | traces. | " "                |
| " of Magnesia ... ..      | 23.14   | " "                |
| " of Lime ... ..          | 17.19   | " "                |
| Phosphate of Lime ... ..  | traces. | " "                |
| Silicious Earth ... ..    | 0.70    | " "                |
| Carbonic Acid Gas ... ..  | 270.72  | " "                |

Prof. Redwood pronounces it to be superior to any other table water, an opinion in which he is supported by Prof. Finkelnburg, Member of the Imperial German Sanitary Office, and other eminent authorities. From personal continuous use and observation of it, we are enabled to speak very highly of its purity, its wholesomeness, its agreeable flavour, and the

aid which it gives to digestion, particularly in cases of gouty or rheumatic tendency. It may be taken either alone or mixed with wine or spirit; and its low price constitutes an additional inducement to place it on every table.

## Notes and News.

THE RAVAGES OF CHOLERA on the Continent continue with little real abatement. In Russia especially, with its millions of people still suffering from the effects of the famine and fever which have devastated that country, the mortality has been very great, amounting to nearly half of the number of persons attacked.

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IGNORANCE OF THE MOST ELEMENTARY HYGIENIC TRUTHS have caused serious opposition on the part of the lower classes in Russia to all sanitary precautions. Rioting, destruction of hospitals, and the murders of doctors and other hospital officials are amongst the common methods displayed by the mob, in their resentment to measures devised for their benefit. Doctors are particularly made objects of murderous attacks, because they are ignorantly charged with introducing the cholera and burying the hospital patients alive. Even the disinfectants employed are alleged to be powders intended to promote the spread of the epidemic.

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IGNORANT PREJUDICES of this kind are, however, by no means new in the history of epidemics. For instance, during the ravages of cholera at Naples in the last epidemic the Italian Government sent a special staff of medical men to cope with it. Very soon after their arrival the Lazzaroni, as superstitious as they were ignorant, and as ignorant as they were dirty in their habits, formed a violent antipathy to the new comers, accusing them of introducing the cholera, although it existed some weeks before their arrival, and of poisoning the wells already poisoned through the utter disregard of the lower-class Neapolitans for sanitary decency, and maltreated the doctors when engaged in visiting the sick. Ordinary ill-usage—an ignorant, brutal crowd always puts its arms and legs into active requisition more frequently than its brains—not proving sufficient to deter the medical staff from doing their duty, the Lazzaroni hit upon an original method of getting rid of the doctors. At every convenient opportunity, and every convenient lurking-place, they fired upon the medicos with such marked aim and results that the doctors having come to Naples to treat cholera in others, not gun-shot wounds in themselves, deemed it

prudent to effect a retreat, leaving the Lazzaroni to settle the cholera question in their own way, and with their own lives.

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THE SECRETARYSHIP OF THE LOCAL GOVERNMENT BOARD could not be placed in better hands than those of Sir Walter B. Foster, M.D., M.P. for the Ilkeston division of Derbyshire, and formerly M.P. for Chester. Sir Walter holds a deservedly high position as a physician, and has given special attention to sanitary matters and preventive medicine, and his selection for this responsible post is not only gratifying to the whole medical profession, but will prove beneficial to the public interests.

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THE NATIONAL REGISTRATION OF PLUMBERS ASSOCIATION held their Third Annual Congress at Dundee on the 7th September and following days, under the presidency of Lord Provost Mathewson. The various district councils were represented by their respective delegates, and the Worshipful Company of Plumbers, London, whose efforts to improve the status and practical education of members of the craft are well known, also sent delegates to take a part in the proceedings. Sir Philip Magnus, Director of City and Guilds of London Institute, Dr. Farquharson, M.P., Mr. Leng, M.P., Mr. Edmund Robertson, M.P., Mr. Whitelaw, M.P., Prof. Crum-Brown, the Lord Dean of Guild, the Lord Provost of Aberdeen, and many other gentlemen, were present. The Congress took into consideration the present position of the plumbers' craft in Scotland, the best means of extending the registration system, and the existing provisions for the technical education and practical training of plumbers. The social enjoyment of the delegates was not lost sight of, for the programme included a banquet at the Queen's Hotel, Dundee, and excursions to St. Andrews and Perth, where the visitors were entertained by the provosts and other civic personages.

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EMIGRATION is the panacea for all Irish difficulties, according to short-sighted politicians. But they ignore the fact that one-fifth of Ireland, representing more than four million acres, is uncultivated. Yet the climate is so temperate that many plants, grown only in hot-houses in England, flourish in the open air, while the fertility of vegetation has obtained for Ireland the name of the Emerald Isle. Between 1851 and 1889, three and a half millions of people left Ireland, the bulk of them going to the United States. Is there any one bold enough to assert that the country has benefited by this enormous depletion?

\* \* \*

PETROLEUM will always be abundant, says Dr. Mendeleef, the eminent Russian chemist, who is of opinion that this valuable substance is constantly being formed by the action of water on metallic deposits existing in the interior of the earth. The



authority whom we have quoted is supported by other distinguished scientists who advance the theory that petroleum forms almost as fast as it is removed.

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**ACCIDENTS TO FACTORY WORKPEOPLE.**—In one factory inspector's district alone—that of Mr. Richmond, of Liverpool—accidents to workpeople occur at the terrible rate of rather more than one each working day. Last year 356 were reported, but these do not include the numerous casualties from machines which being worked by hand are not within the Government inspector's cognizance. Out of these 356 cases the large proportion of 74 resulted in death.

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**EARLY SANITARY LEGISLATION.**—The importance of sanitary legislation was recognised at an early period of English history. Even in the reign of Richard II., a law was passed, imposing a penalty upon any persons guilty of throwing garbage into streets or streams of water; and in the time of Henry VIII., it was enacted that all cattle should be slaughtered outside the boundaries of populous places.

\* \* \*

**WEAR AND TEAR.**—In a lecture on this subject, Dr. William Stirling, Professor of Physiology in the Victoria University, Manchester, remarked:—"The heart beats for a certain time and rests for a certain time. As a matter of fact the working heart spends two-fifths of its time in action, and three-fifths of its time in rest, or a period of repose. An increase of temperature, no matter how it is caused, leads to an increased waste, and to an increased tear and wear of all the tissues in the body. The heart in fever beats more rapidly, partly because the temperature is higher; and you will see, therefore, that in fever the heart is subjected to an excessive strain. Hence one of the reasons why prolonged fever produces so serious an effect upon the heart. The heart having so short a time for repairing the waste that goes on in it, is apt to break down under the strain, and in fact, in many cases undergoes an actual change in its structure.

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**WHAT IS A PINEAPPLE?**—At an old-fashioned hotel in London two gentlemen were dining, when a dispute arose as to what a pineapple was; one gentleman insisting that it was a fruit, the other, with equal confidence, asserting that it was a vegetable. A bet was made, and the diners agreed to accept the decision of the head-waiter. Now, he was as old-fashioned as the hotel itself, in which he had spent many years of his lifetime. He was called to the table. "John," asked one of them, "how would you describe a pineapple? Is it a fruit, or is it a vegetable?" John rubbed his hands, placed his head on one side, and with a pitying smile, replied:—"It's neither, gentlemen. A pineapple is an *extra*."

**BABY-FARMING.**—Tens of thousands of little ones die annually, not actually murdered—no! the law does not take this view—but at any rate slowly done to death by studied neglect and mismanagement on the part of persons who have undertaken the charge of these human flotsams and jetsams. Some day, when life is regarded by the law with the same jealous care as property, we shall be better able to cope with this disgrace to modern civilisation.

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**LADIES' TRAINS**—to their dresses, be it understood, for although some of the railway lines, a few years ago, started ladies' compartments (which the fair sex did not take kindly to, by-the-bye,) none have ventured on running a train for ladies only—have long been a subject of attack, for sanitary and other reasons. At any rate, hygienists are in the right in their opposition to such an unwholesome style of dress. "One day last week," writes a contributor to *Truth*. "a friend of mine walked down Piccadilly behind a lady who was wearing a dress fitted with the long train now in vogue. Opposite the St. James's Club she got into a cab. She consequently left behind her on the pavement all the rubbish which her skirt had collected as it swept down Piccadilly. My friend, being of a scientific turn, proceeded to make an inventory of the collection, and he has been good enough to send it to me for publication. I give it below. In the days when germs and microbes play such an important part in social life, I question very much whether these trains should be permitted by law. This lady left her street sweepings on the kerb-stone; but it must be remembered that many convey them into their own or their friends' houses:—Two cigar ends, nine cigarette ends, a portion of a pork pie, seven hair-pins, four tooth-picks, one stem of a clay pipe, three fragments of orange peel, one piece of cats' meat, part of the sole of a boot, one plug of tobacco (chewed), straw, mud, scraps of paper, and miscellaneous street refuse." Certainly, this careful observer has good grounds for his suggestion that such an unsanitary and disgusting fashion should be dealt with by the law; but this might be done in a way which would deter other ladies from the practice of wearing trailing dresses. In St. Petersburg, every man who is taken up for drunkenness, whatever may be his social position, is compelled as a punishment to join the street-sweeping gang on the following morning, and it is not an unusual thing to see gentlemen well attired, some even in evening dress, engaged in this useful though humble occupation. If a few rows of ladies dragging sweeping trains behind them were required to perambulate our principal thoroughfares for the purpose of cleansing the pavements, it would render a public service, at the same time it would more effectually than any other means cure the wearers of their infatuation for drawing behind several unnecessary feet of dress material.

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## THE STATE AND THE HOMES OF THE POOR.

By JOHN HAMER, Honorary Secretary of the Mansion House Council on the Dwellings of the Poor.

SANITARY reformers all the world over have a great cause, *not* "to rest," but certainly "to be thankful" when they review the great advantages which have been gained during the past century. In 1774 the death-rate in London was 48·1 per 1,000; in 1889 it was 17·4. But the progress of science, as applied to the prevention of disease and the prolongation of life, has been vastly accelerated during the last twenty-five years. Sanitary science owes its position to-day most of all to the fact that the world has begun to perceive that it is to its interest to take care of the people, and especially of the wage-earning classes. Philanthropy assumes a totally different aspect in the eyes of the world when it is able to demonstrate that it pays to keep the people healthy. The health of the people is the wealth of the State; for though it would, indeed, be impossible to estimate more than very roughly the loss of money which a community suffers from the loss of wage-earning power during sickness, it needs no argument to show that the amount every year is simply enormous. If this be a mean and mercenary way of looking at the matter, it is, at any rate,

one which has enabled reformers to convince mankind that it is better that its workers should be decently housed in healthy homes than that they should be allowed to herd in hovels which become centres of disease and a danger to the whole community. The growth of public opinion as to the value of healthy surroundings is even yet very slow in comparison with the real importance of the subject, and we look with fervent aspiration to the time when society shall have become so permeated by a love of order, a sense of decency, and a proper spirit of independence, that the people themselves shall insist upon "a healthy home" being as much their birthright as the air we breathe or the light we love.

State regulations can do much to improve the condition of the people, but no legislation will make good citizens unless the citizen understands, appreciates, and adopts the laws made. Even when this is done, and the self-government of the people becomes a realised fact, there will still remain certain vital matters which must ever be of national importance, and which cannot be left to local *laissez-faire*. Health and education are two such matters, and their control ought to be matters undertaken by the State. Ignorance fosters crime; insanitary conditions result in enfeebled manhood; and miserable homes produce and perpetuate a low state of mental and moral health. Co-operation and building societies, which enable the people to acquire their own homes, distinctly raise the level



of the working class, and give them a personal interest in promoting sanitation. But even such well-meant methods may be abused, when the greed of the money-maker steps in and defeats the aim of the philanthropist. I believe it is true that one of the largest artisans' dwellings societies in London no longer strives first to get the workman to buy his house, but attaches more importance to paying good dividends to its shareholders. Improved dwellings, especially on the block system, are by no means an unmitigated blessing, though they do not deserve all the condemnation bestowed upon them. In large towns it would seem to be almost inevitable that such erections should exist, and, under proper control, they present distinct advantages as to sanitary arrangements, facilities for inspection, &c. Against them, the gravest objection is their height; the rooms of some of the best are, on the ground floors, never penetrated by a ray of sunlight; whilst in the very large blocks, the terrible catastrophe that might at any time result from a fire is too horrible to contemplate. Practical workers amongst the poor agree pretty much that moderate-sized blocks are not disliked by decent people, but large ones, which render even comparative isolation most difficult, are not popular. All attempts at approaching the cottage system, where at all possible, are decidedly to be encouraged. The State can do a great deal by compelling railway companies to run cheap workmen's trains within a fixed zone round every large town, and the unused land frequently held by railway companies might be utilised with advantage for the building of cottages, to which cheap trains would bring occupiers. Here again the State, in the interests of the whole community, should assimilate the Sanitary and Building Acts. Otherwise, such anomalies as those we suffer from in London will continue. We sweep away a rookery from Bethnal Green, and permit the erection of one little better at South Tottenham. No more striking object-lesson could be presented to those interested in

this question than can be seen in the course of a drive from Piccadilly to Edmonton. The entire way, about nine miles, is lined with houses, and outside the metropolitan area, where you ought to come to healthily-built houses with the charming surroundings that characterise the country, you find jerry-built houses by the score. These are in most cases densely packed, so that the population is already as great in proportion to the area as districts in the East of London, which have long been condemned as "slums." If we cannot, like Queen Elizabeth, issue a mandate that no more houses shall be built in London, we can at any rate say that houses, wherever built, shall at least be in accordance with the elementary principles of sanitary science.

It is no part of this paper to deal with political questions. Sanitary reform and the health of the people ought to be far removed from the arena of party conflict. Nevertheless, the ownership of the land will, unless wisely and prudently dealt with, very soon become a crucial question which may provoke the fiercest passions and lead to the direst results. In our own country the greatest variety exists owing to the differences of tenure. In Leeds scarcely a house is built upon anything but freehold land, whilst in Sheffield and Huddersfield hardly a house is to be found that is not erected on leasehold property at present irredeemable.

Municipal enterprise can do, and has done, a great deal for the people, especially by the provision of lodging-houses. Examples are found in Glasgow and Liverpool.\* But nothing short of central State control can, or should be allowed to, regulate vital necessities of life. Under such control I would place water supply, artificial lighting, the provision of open spaces to secure abundant fresh air, and sufficient medical supervision to insure the stamping out of infectious

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\* The London County Council are now erecting a lodging-house on an extensive scale in central London.  
—*Ed.* HYGIENE.

disease, with the duty of providing against invasions of foreign epidemics. No commercial company ought to be allowed to make money out of a monopoly in the supply of the vital necessities of a healthy home. Decentralise as rapidly as the growing intelligence of the people will permit; but you must always have imperial control over local authorities if you want to secure the efficient working of the Sanitary Acts. Without such centralised supervision, one locality, by neglecting its duties, may spread an epidemic throughout its better administered neighbours. Medical officers of health should be State servants, responsible to a ministry of public health, and not under the absolute control of property owners constituting the local authority, whether it be a town council or a parish vestry. The sanitary staff of every locality should be of a much higher status, and subjected to the test of proper examination, whilst the pay of medical officers who look after the health conditions of our towns should be higher than at present. It seems incredible that one of the largest districts in London advertised not long since for a medical officer of health to superintend the sanitary condition of a population of 120,000, and offered a salary of £200 a year, with the stipulation that he should attend *half an hour each day at the office!* And this is a district quite recently convicted by a public inquiry of the grossest negligence in sanitary administration.

In my opinion—and I speak from some years of personal experience—the soundest policy for the regulation by the State of the homes of the poor is through such a machinery as I have indicated, supported by a more cordial co-operation of all classes in the local government of the country, and by the gradual and persevering education of the people in the duties and responsibilities they owe to each other and to all in the maintenance of cleanly and well-ordered houses.

[On the subject of block dwellings and cottage homes for the working classes, we would refer our readers to the articles by Dr. Sykes and Mr. Rowland Plumble, F.R.I.B.A., in *HYGIENE* for October and November, 1891, and for January and February, 1892. —*Ed. HYGIENE.*]

## THE NEEDS OF THE METROPOLIS IN RESPECT OF HOSPITAL ACCOMMODATION FOR PATIENTS SUFFERING FROM INFECTIOUS DISEASE.

By T. ORME DUDFIELD, M.D., Medical Officer of Health for Kensington.

It is an accepted axiom that provision for the isolation of infectious disease should be at the rate of not less than one bed for each thousand of the population. The subject, as regards the metropolis, was considered by the Royal Commission in 1881-2; and the Commissioners stated in their report (1882) that the then provision of hospitals should be extended so as to provide 5,100 beds at the least—viz., 3,000, nominally, for “fever,” and 2,100 for small-pox. Diphtheria cases were not at that time admissible to the hospitals. The population of London in 1882 was a little under 4,000,000. Consequently the recommendation of the Commissioners went, to the extent of 1,100 beds, beyond the theoretical requirements of the day. Naturally, however, they intended to make provision for a lengthened period in advance.

As respects “fever,” nothing happened, prior to 1887, to lead the Managers of the Asylums Board to think that they would be likely to require so many as 3,000 beds, and the only step taken by them towards giving effect to the recommendation of the Commissioners was the erection of the Northern Convalescent Fever Hospital, at Winchmore Hill, for about 480 patients. In 1887, however, an epidemic of scarlet fever tasked their resources to the utmost. Not only were all the available beds filled, but a large and costly addition of temporary huts had to be run up in the grounds at several of the hospitals; and the “Poplar” Hospital, at West Ham, was also brought into requisition. And yet the deaths from scarlet fever (1,443) were 381 below the decennial average. The total number of “fever” patients received into the Managers’ Hospitals in that year, including 5,900 suffering



from scarlet fever, was 6,537, or nearly 4,000 more than in any previous year, the maximum number under treatment at any one time was 2,600, or about 700 in excess of the normal accommodation.

The great increase in the number of persons admitted was largely due to the increased facilities afforded by the Managers—whose new Regulations, issued in that year, permitted of the reception of patients upon the application of any duly qualified medical practitioner—and to an Order of the Local Government Board, giving effect to a recommendation I had made in 1875—viz., that the certificate of any duly qualified medical practitioner should be accepted as evidence of the nature of the infectious disease. But the operation of compulsory notification must not be left out of account in any explanation of the growing disposition of the public to make use of the rate-supported hospitals; or, I would add, in estimating the probable requirements of the future. How greatly these causes, and the depauperisation, in 1883, of medical relief in the hospitals, which I had been advocating since 1877, operated to popularise the use of these institutions, may be inferred from the fact that the admissions of scarlet fever cases in 1891, when the mortality (589 deaths) was the lowest on record, were no fewer than 5,262, or only about 650 less than in the epidemic year, 1887. These numbers have been exceeded during the present year, for already, in forty weeks, the admissions total up 9,459, although the mortality is not likely to exceed the average to any large extent, the deaths in the forty weeks, to the 8th inst., having been 818 only, the decennial average, for the years 1882-91, being 1,174.

If the demands, for scarlet fever only, upon the accommodation provided by Managers have been so great, under the circumstances above set out, it may well be asked what would the demands be were the metropolis again afflicted with an epidemic like that of 1870, when the deaths from scarlet fever were 6,040 out of a

population of three and a quarter millions; or even like that of 1880, when the deaths from this cause were 3,100 out of a population of three and three-quarter millions? In the former year there were no hospitals; the epidemic ran its course without check, and I do not expect ever again to see such a terrible death-roll from scarlet fever in London. But in 1880 the hospitals were in operation; the admissions, however, were under 2,000, and less than two-thirds of the number of deaths in London; whereas, in 1891, with a population of four and a quarter millions, the admissions were not far short of ten times as many as the deaths, 61 per cent. of which took place in the hospitals. It must be manifest, from these figures, that the demands of scarlet fever alone are by no means unlikely to require for their satisfaction a number of beds equal to one in a thousand of the population, say 4,300. At the present time the beds occupied are about 3,650, a number which is not unlikely to rise to nearly 4,000, on full occupation of the new hospital, which will shortly take place, should the epidemic not previously abate.

A further allowance will have to be made for enteric fever and diphtheria. The average annual number of deaths from enteric fever in the ten years 1872-91 was 1,113; the notifications of cases in 1891 were 3,372, and the admissions to hospitals were 755, the largest number on record. This disease is markedly on the decline in London; the admissions to hospitals, however, are increasing. Diphtheria, on the other hand, is markedly on the increase. The notifications, which were 5,907 in 1891, were no fewer than 1,002 in the four weeks covered by this report. The deaths for some years past have exceeded the deaths from scarlet fever. Last year they were considerably more than double as many, and already in this year the deaths (1,303) far exceed those from scarlet fever (818) by nearly 500. The admissions to hospitals, moreover, are becoming more numerous; 722 and 942 in 1889 and 1890 respectively,

they were 1,312 last year. It is manifest, therefore, that a considerable number of beds will have to be set aside for these diseases, as well as a small number for typhus and ill-defined forms of fever—the average number of deaths from which in the ten years, 1882-91, was 87—and for isolation purposes.

On the whole, then, I am of opinion that provision should be made of not less than 5,000 beds for scarlet fever, “fever,” and diphtheria, and isolation.

As regards small-pox the state of affairs presents a more hopeful outlook. There has been no epidemic since 1885, when the deaths in London from this disease were 1,419, and the admissions to the Asylums Board Hospitals 6,146—numbers which pale in presence of the fearful totals of 1871, when the hospitals received upwards of 13,000 cases, and the deaths in London fell little short of 8,000. In happy contrast with this state of things the experience of the last six years, 1886-91, may be cited, the total admissions having been 307 only and the deaths 54. We may reasonably hope for a continuance of this immunity—provided the Vaccination Law is efficiently administered—as a result of compulsory notification, which has worked admirably, and has probably been the means of preserving London from an epidemic this year. The practice of removing the sick out of London, carried out of late years, in accordance with the recommendation I made in 1881, has also been attended with the best results, and still further encourages the belief that London will not again suffer as in 1871, or even as in 1881, when the admissions were 8,551, and the deaths 2,367.

It is probable, therefore, that the accommodation provided by the Managers for this disease, amounting to 1,150 beds—viz., 350 on the hospital ships, and 800 at the Gore Farm, Darenth—may suffice. It could be supplemented by tents, kept ready to hand, should need arise; though I would earnestly press for an additional convalescent hospital, south of the Thames,

which could be used interchangeably for small-pox or “fever” on occasion. It should be remembered that the Royal Commission recommended provision of sites and buildings which could be made capable of receiving 2,100, or by special exertion 2,700 small-pox patients, a recommendation to which effect could be given by the erection of the suggested hospital.

If the above calculations are even approximately correct, it follows that London requires in its rate-supported or public hospitals, at least more than 6,150 beds; some 1,050 more, therefore, than the Royal Commission recommended in 1882. The normal accommodation already in existence, or provided for, at the several hospitals, appears to be about 3,959 beds—viz., at the Eastern Hospital, 298 beds; the North-Western, 411 beds; the Western (shortly to be raised to), 400 beds; the South-Western, 338 beds; the South-Eastern, 426 beds; the North-Eastern (shortly to be raised to), 456 beds; and the Northern (for fever convalescents), 480 beds. Total, 2,809 beds. To which must be added the hospital ships and the Gore Farm Infirmary, for acute cases of small-pox, 550 beds; and the Gore Farm Hospital for Convalescents, 600 beds. Total, 1,150 beds. The Administrative Department at the last-named hospital, it may be mentioned, was designed for 1,000 patients. By utilising this hospital for scarlet fever cases; by placing additional beds in the wards of the various hospitals; and by diverting rooms hitherto in use for other purposes; by the erection of temporary wooden huts in the grounds at several of the hospitals; and, lastly, by the erection of the North-Eastern Hospital, the Managers have increased the accommodation for patients to, at the present date, 4,110 beds—or 4,410 if account be taken of the beds remaining to be brought into use, soon, at the last-named hospital. The 4,110 beds are at present appropriated to the several diseases as follows:—Scarlet fever, 3,550; diphtheria, 280; enteric fever, 130; other fevers and isolation, 150. This accommodation, how-



ever, would be appropriated otherwise to the various diseases, as their relative prevalence might require.

Now it is hardly necessary to insist on the abstract impropriety of placing additional beds in wards, or of diverting to the use of the sick, during the prevalence of an epidemic, rooms usually employed for other purposes, and no one defends the costly expedient of temporary huts. It is manifest, therefore, that provision of a permanent sort should be made to supply the reasonable maximum requirements of the metropolis. How this should be done is a subject well worthy of the attention of the Asylums Board, and, indeed, of the Local Government Board. The accommodation that remains to be provided, if my estimate is correct, would be, in round numbers, 2,200 beds. How and where this could best be done is the question. Among the first points, perhaps, to be settled would be the number of beds which may properly be placed on a given space, say in pavilions of two storeys each. And to what extent additional accommodation may properly be provided on the existing sites; as the more economical plan obviously would be that of enlarging the present hospitals. The North-Eastern Hospital site, for instance, is adequate for a thousand beds; the North-Western Hospital, about to be rebuilt, could be enlarged; the Western Hospital could be still further extended. Another highly important question to be solved is the requisite provision for acute and convalescent cases respectively. The latter class of cases should, as I have intimated, be provided for by another hospital a little way out of town, where less difficulty would be experienced in finding a site. Should it be found necessary to provide a new hospital for acute fever cases in London, it would be well, perhaps, to make an effort to obtain the site of the London Small-pox Hospital—failing success in other directions; although I, for one, am not prepared to believe the difficulty of procuring sites to be insuperable. It is,

however, unnecessary to elaborate this branch of the subject; it is one for inquiry by a responsible authority, and inquiry should be followed by action. The next epidemic should not be allowed to find the Asylums Board unprepared. London should not again suffer the anxieties of 1887 and 1892; nor be burthened by a repetition of wasted expenditure, on temporary accommodation, to an amount probably equal to half the cost of providing the permanent accommodation necessary. This is a question that concerns every Sanitary Authority in London, no portion of which can suffer from infectious disease without endangering all the rest. And the hands of the Asylums Board should be strengthened by those authorities, who immediately represent the ratepayers of this great metropolis.

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### THE PHYSICAL AND INTELLECTUAL DISQUALIFICATIONS OF WOMEN FOR HARD WORK.

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By ALFRED J. H. CRESPI, Wimborne, formerly  
Editor of the *Sanitary Review*.

THE employment of women, in the large sense in which the term is now used, has completely passed out of the field of discussion, and thousands of ladies have embarked on the troubled sea of commercial and professional life. Even the Universities and some of the learned professions have reluctantly and ungraciously opened their doors to them; and though great allowance must be made for the exceptional energy and ability of those ladies who have passed severe examinations, their success both in examinations and subsequently has been sufficiently pronounced to justify the greater freedom of the present day. The employment of women must now be left to the free haggling of the open market. It is mere waste of time to oppose great social changes; they are certain, when the right time comes, to be carried out, and those who oppose them are few compared

with the indifferent many, and the large number who favour reforms—partly from an abstract feeling of justice, partly from sympathy and fairplay towards the weaker sex. Common sense demands that women should be perfectly free and allowed to make their way as best they can in the battle of life.

But the problem is not solved, and whether the competition of women for the higher kinds of employment will ever be great is uncertain. It is in the very nature of things that many women should marry, and that all should hope to marry, while the most attractive commonly get engaged early in life, and what is then, in the latter case, the almost invariable consequence? that unconsciously they relax their efforts and ultimately abandon their profession or calling. It is simply preposterous to talk of married ladies discharging creditably and efficiently their household duties, and at the same time carrying on the engrossing and anxious work of a profession, as professions are managed in these days. We have heard enough of ladies who merely lie by for a week or two when an increase of their family is expected, but toil like martyrs both before and after. Such cases are, and must always be, exceptional. The consequences of marriage are too familiar to need dwelling upon, and after marriage ladies find that if weak health is not a serious obstacle to regular employment, the care of their children and households is too engrossing to allow leisure for other less pressing matters. I knew a young girl, considered by her friends to be exceptionally talented, who was given many educational advantages with a view to earning her living; well, she speedily got engaged to her cousin, and though she did not marry him for some years, she at once lost all interest in studies which required undivided attention. A sister-in-law of hers, a girl with an exquisitely sweet contralto, and thought capable, probably with good reason, of getting a large income as a music teacher and festival singer, has become engaged to a relation, and already,

though not intending to be married for some years, her thoughts are wandering and her efforts relaxing. These are only two cases out of many that I have known, while any one could from his own experience give many others very similar.

That married women should work hard in the higher professions and callings is, with rare exceptions, absolutely impossible, nor would it be in the interest of their families, and ultimately, of the race, that they should. While the difficulties connected with the mother's impaired health would not be met, it would be undesirable and unnatural that her offspring should be brought up by hand and entrusted to the care of servants, in those comparatively narrow circles where this would be practicable; but, of course, most married women, although they might not belong to the classes engaged in manual work, would not be well enough off to employ nurse-maids. How could a middle-aged shop assistant, a post-office clerk, or a small shop manager employ a nurse? Indeed, were not maternal affection to force her to look after her own offspring, it would not be economically advantageous to neglect her home and children to earn the slender pittance which, in the vast majority of cases, she could alone count on getting. So that it resolves itself into this—that the natural destiny of woman is marriage, and marriage brings with it serious responsibilities and distractions. Most women, unless the conditions of society greatly change, will never be, for any length of time, the competitors for employment with, and the rivals of, men; and, omitting those exceptional women who never marry, and the few married ones who do not have families, the physiological objections to female employment on a large scale after marriage are great and unanswerable.

But the question is very far from settled when it is admitted that a few women have acquitted themselves creditably in examinations, and have done fairly well in the subsequent battle of life. Female employment is no new



thing after all; many departments of work have always been made over to women. For instance, the management of children and household work are surely not unimportant matters, and they have always employed, and will always employ, a large proportion of all the women living at any given time. Among rude races and in primitive society women do many things which, in more polite circles and days, are done by men; in fact, the tendency of advancing civilisation is to curtail the field of female employment, and to relieve women of many burdens which they unrepiningly submit to in other circumstances. Indeed, the more favoured the family position the less work do women attempt; and while the labourer's daughter hoes turnips and potatoes, and nurses her baby brothers and sisters, the tradesman's daughter is much freer from household cares; while the opulent gentleman's daughter does nothing at all, often hardly caring to go an occasional short walk, or to take part in lawn-tennis.

It is, however, generally believed that the employment of women has great economical disadvantages; it seems probable that with increasing command over the powers of nature and improved machinery men can produce everything needed for their own support and that of the female members of their families; nay more, it is asserted that, so far from the mere increase in the gross numbers of workers actually increasing the work done, excessive competition for employment positively hinders the improvement of machinery. When wages are high every effort is made to economise labour and to give mankind increased facilities for improving mechanical appliances. In the United States machinery does many things, which manual labourers do among us, while in England machinery does a great deal which the cheaper labour of the Continent takes in hand as a matter of course. Where is the general condition best? Why, where work is less severe. Cheap labour is often unskilled and inferior, so that it is incontrovertible

that, as a whole, the competition of women, though it should not be prevented by legal enactments, is not the advantage to the race one might expect. This cannot be denied; at the same time, some women of exceptional parts, and many who have only themselves to depend upon, are compelled, either by genius or poverty, to exert themselves, and for such as these the field should be left freely open.

There is no question, however, that many advocates of female employment have other views. Some of them regard women as the equals of men; some even assert that the female intellect is superior to the male; others that there are differences in the two which demand a division of the field, women doing those things for which they are especially fitted, and men the ones for which nature has designed them. Let us briefly examine both sides. Are women, as a rule, the equals of men? Here a very difficult part of the subject is touched upon, and I am sure to give offence to many readers. Physically, certainly not. Their bodily disabilities are in part of a character inseparable from their constitution; in part due to a feebler physique and a lower stature. True, hundreds of thousands of women are fully as tall and strong as middle-sized men; none the less, however, are women on the average smaller, weaker, and less capable of sustained physical endurance. There is no running away from this fact, nor can its significance be easily overrated. In the fierce and perfectly awful struggle for existence going on around us no profession welcomes fresh competitors, though when a brilliant position is once made, the holder is courted and fêted. Doctors, lawyers, authors, commercial men and tradesmen no more welcome fresh male competitors than do women additional governesses, music teachers, or schoolmistresses. A successful man has to force his way, hurling his rivals out of his path, and the fiercer determination, loftier stature, and greater endurance of successful men are no small part of their superior advantages. Now there can be no doubt that the male sex has

conspicuous advantages over the female, just as one race invariably beats another. Could we hold India a single year were it peopled by Germans, Frenchmen, or Americans? Assuredly not. The feebler race gives way before the stronger, as the feebler sex yields to the more powerful. This may seem a "brutal" fashion of regarding the question; but its force cannot be explained away, although many advocates of women's rights affect to sneer at it and talk of "brute force" as though they had convicted men of unfairness, and of using powers which they ought not to resort to. The very fact that women have had of late to accept as a favour from their male rivals many concessions is proof positive that they are not endowed with equal powers of endurance and self-assertion.

Intellectually the inferiority is not less marked. Whatever women have done *that* men have easily accomplished, and in every field some men have eclipsed their most formidable female competitors. True, this argument may be pushed too far, and it is a favourite sneer of ladies that such comparisons have nothing to do with the fitness of ordinary women to compete with commonplace men. Nevertheless, while the physical endurance of men and their loftier stature are much greater than those of women, their intellectual successes have not been less pronounced. It is often asserted that the differences in the methods of education have put women at a signal disadvantage; but surely that is preposterous. Ordinarily aptitude may be developed; talent may be trained; but genius, that supreme, divine something which found expression in the "Divine Comedy," the Sistine Madonna, the plays of Shakespeare, the Duomo of Florence, "Paradise Lost," and the "Messiah," must make itself heard, interpose what obstacles the world or fashion likes. What have women done compared with men? Sappho, Elizabeth Barrett Browning, and Mrs. Hemans are a poor triumvirate against the

hundreds of men whose aspirations have found expression in lofty verse. Where are the dramatists to set against Shakespeare, the Greek masters, Racine, Corneille, Molière, Alfieri, and Goldoni? Can Lady Butler, Rosa Bonheur, and Angelica Kaufman balance Raphael, da Vinci, Rubens, Salvator Rosa, Titian, Benvenuto Cellini, and a thousand others? Where are the female sculptors, the female architects, the female workers in the precious metals? Where the rivals of Handel, Costa, Verdi, Bach, Rossini, Haydn, and a whole host of musical composers? Where the female leaders in science, the discoverers, the inventors? Where the essayists, the wits, the historians, the critics? In fiction, women have certainly held their own excellently, and in the abundance of high-class work, if not in its superlative excellence, need not fear detraction. Who would attempt to depreciate the merits of George Eliot, Georges Sand, Mrs. Gaskell, Mrs. Oliphant, and the authors of "Uncle Tom's Cabin," "Feats on the Fiord," "Evelina," and "Jane Eyre"? Nevertheless, even in this field the balance is decidedly against them, and Scott, Thackeray, Dickens, Lytton, Wilkie Collins, and Balzac are tremendously heavy weights, to say nothing of Defoe, Fielding, Richardson, Cooper, Blackmore, and Trollope.

Surely no one can deny that, from the overwhelming number of educated ladies with ample leisure and abundant means, with facilities, therefore, not possessed in anything like the same degree by men, there ought to have been, if not equality, at any rate such a set-off that, not in fiction alone, but in every walk of letters and the arts, to say nothing of science, the triumphs of the female intellect should have been of the first order. I scarcely think the answer is as favourable to them as even their warmest supporters could wish.

Again, how many inventions have been due to male mechanics, artisans, and miscellaneous workmen? But no amount of training will make an inventor. Now, surely, factories have for generations swarmed with intelligent women—



forewomen, employers, and dayworkers—and yet has any one of them invented a spinning-jenny, improved an electromotor machine, or done anything to economise labour in any degree? In the power of originating women are notably inferior, and in the power of perfecting they fall far behind men.

Even in those trades in which women are generally employed men are indispensable, while male cooks, from their better methods and greater precision and exactness, easily hold their own in the teeth of all female opposition.

Nor can this be merely from the determination of men to exclude women, though even that would imply that the latter could not successfully force their way, and so were inferior, for many men in our day would welcome the competition of women, and large numbers of ladies would assuredly employ and support their own sex, now that women's rights are attracting so much respectful attention.

So far then, and let my arguments be taken for just what they are worth, but still I do not deny that many women are compelled to depend on themselves for a living; what can they do? Let us see. First as to the numbers. A recent report of the Registrar-General is significant; it draws pointed attention to the marked falling off in the marriage rate and to the higher average age at marriage. Should the present tendency continue—still more, should it increase; should marriage become less frequent, or be postponed to a later age—many serious objections to the employment of women would be silenced. Unmarried women would be better able to compete with men; and, should their numbers increase, would more often devote themselves to commercial and professional life. Domestic service has always been reserved for women of the inferior grades; but in the overwhelming majority of cases it is only a temporary condition, and after marriage domestic service commonly ceases. Vast numbers of women, too, find employment in factories, and not a few in

warehouses. In these walks no expansion seems probable or possible.

In the annual report of the Registrar-General for England and Wales, the population of that part of the United Kingdom in the middle of 1886 was estimated at 28,870,587. On this population all the ratios in the report were based. The excess of births over deaths since the census of 1881 would have given a higher population by 75,000, and that modest sum represents the emigration over the immigration; the net immigration may, when the next census is taken, be found to have been considerably affected by the influx of poor foreigners, to which England, but more especially the metropolis, has lately been subjected. Allowance must also be made for the marriage-rate; this is falling in so remarkable a manner that the growth of the population cannot fail to be somewhat checked, though against this falling off must be placed the increased longevity due to better sanitary conditions. In the annual report of the Registrar-General published in February, 1887, the marriage rate of 1885 was stated to be the lowest since civil registration began; it had only once been paralleled—in 1879. The report, dealing with 1886, shows a further decline, so that the marriage-rate for that year was absolutely the lowest on record. The number of persons married was in 1853 17·9 per 1,000—this was the highest rate; in 1882 it had dropped to 15·5, and from that time there has been a continuous decline; 1887 showing a rate of 14·1, compared with 14·4 in 1885. This fall is co-incidental with a diminution in the value per head of British exports as well as with a lower price of wheat. Concurrently with the falling off in the marriage-rate the age at marriage is advancing; this has been going on for thirteen years, and the average age of bachelors and spinsters at marriage in 1886 was the highest ever recorded. Yet the Registrar-General states that “under-age marriages are still very numerous,” eight per cent. of the bachelors, and nearly one-fourth of the spinsters, married in

1886 were under age. Comparing class with class we find that early marriages are characteristic of the working classes. Working men marry earlier than clerks, clerks than farmers, and the latter than the professional and independent classes. Spinsters in humble life marry earlier than those of higher rank. Of all occupations, miners and textile hands marry earliest. In passing through the different social grades the age rises more rapidly among bachelors than spinsters; consequently, the discrepancy in age between the bachelor and his bride is greatest in the highest classes. In these marriage statistics a very satisfactory feature is the diminution of cases in which the register is signed with a mark; instances of this kind are now only a tenth of the total, whereas one-third of the men signed with a cross forty years ago, and nearly one-third of the women. It is noteworthy that in the agricultural counties men are the worse educated, while in mining and industrial counties women. The exceptionally low marriage-rate of 1886 accompanied the lowest birth-rate since 1848; the rate was in 1848 as in 1886, 32·4 per 1,000. The death-rate of 1886 was the lowest recorded, with the exception of 1881 and 1885; in 1881 the mortality fell slightly below, while in 1886 it was a little above, 19 per 1,000. For some reason a considerable part of the male mortality lies outside the sphere benefited by sanitary measures. It may be that men oftener than women suffer from violence, overwork, drink, and vicious excesses. Among a thousand of the urban population, twenty die in a year, whereas the rural rate is only eighteen; the difference is much less than formerly. The healthiness of towns, measured by the death-rate, is improving more rapidly than that of rural districts; the towns, however, afforded more room for improvement than the latter.

Still more recent reports show that the death and birth rates continue to fall, while the marriage rate remains practically stationary; hence more women are certain to be thrown on

their own resources and to be competitors for employment.

Bearing very closely on this subject—a woman's prospect of marriage—was a paper by Dr. Ogle, read before the Statistical Society last March. It literally bristled with curious facts. He showed that in counties where young women could earn good wages, and so help to swell the family revenues, marriages were commonly much earlier than when an opposite condition obtained. In Bedfordshire, which heads the list, women marry early and choose very young husbands; while in counties where the men earn largely and the women earn less the men marry later, but choose young wives. Dr. Ogle then proceeded to show that 3·9 marriages annually per thousand persons living would keep up the population at its present high figure, but the smallest number of marriages has never been under 7·05. In 1873 the bachelors averaged 25·6 years, and the spinsters 24·2, but in 1888 the figures stood respectively at 26·3 and 24·7. In the professional and independent classes the mean age of the bachelors is seven years, and of the spinsters four, above that of the mining class, while a far higher proportion remain permanently celibate in the richer and more influential circles. In the independent classes the mean age of the women at marriage was, Dr. Ogle showed, 26·5; nevertheless, he argued that retardation of marriage would be increasingly and necessarily the rule generally.

*(To be continued.)*

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THE VALUE OF VACCINATION is practically illustrated by an anecdote which is given in the last annual report of the Sanitary Commissioner of the North-West Provinces of India. He says that in one of the provinces two leading Mahajans submitted their daughters to the Government vaccinator, but concealed their sons, congratulating themselves on having been so successful in their trick. But soon afterwards an epidemic of small-pox broke out, the sons died, and the daughters, who had been vaccinated, escaped the disease.



## WINTER AND SPRING IN THE CANARY ISLANDS.

By FRANCIS PARSONS, M.D.

BE the cause what it may, few will dispute the fact that, with every recurring winter, an increasing number of invalids from Britain are sent to warmer regions with the object of improving their health or prolonging their life.

It is constantly asked, by those interested in the development of home health-resorts, whether many of these might not derive greater benefit if they sought some sunny watering-place in the South of England; where they would escape the inconveniences incidental to a long journey, be accessible to their friends, and command the comforts of an English home.

Every medical man who has practised at foreign health-resorts can bear testimony to the number of unsuitable cases sent abroad—cases that would be far better at St. Leonards, Bournemouth, Torquay, or some other place on an English coast; possibly better in their own home; but there are many that would not—many to whom climatic conditions, unattainable in England, are absolutely essential—and the conscientious physician is bound to consider the interest of his patient before all other interests.

To suppose that all English invalids can be as efficiently treated in England as under more favourable climatic conditions abroad is as absurd as to imagine that the population of these islands can all be economically fed upon home-grown produce.

The fact is, the British have long since outgrown Great Britain, and spread themselves all over the world; it must indeed be a "*Terra Incognita*" where we do not find either an English missionary, an English merchant, or an English medical man.

Before sending patients abroad doctors will do well to consider: (1) What are the precise physical influences and climatic conditions de-

manded by the case? (2) can these influences be secured in England? and (3), if not, where are they to be found?

What is usually demanded is an equable warm temperature with plenty of sunshine, a moderately dry atmosphere, with little wind or rain, so that invalids can spend most of their time out of doors, without risk of chills.

In addition to this, a pure water supply, good sanitation, comfortable hotel accommodation, and a resident English physician are essential to the safety and comfort of English invalids.

I know no place in Europe where all these conditions co-exist. It would be out of place in writing of one health-resort to decry others; there is no perfect climate. A more lovely district than the French and Italian Riviera it is difficult to conceive, but I have known snow at Nice, and encountered tormenting winds between Hyères and Cannes, where the intensity of the solar heat appears at times to cause air currents which are a terror to the invalid; there is not only the mistral, but the tramontana and the sirocco to be reckoned with.

Of course, there are protected valleys and sunny mountain nooks, especially in and around the Mentonian amphitheatre; but the very picturesqueness of the scenery tempts people to excursionise, and a short exposure to the mistral may undo the good that has taken months to bring about. What is wanted for that class of pulmonary invalids whom it may be deemed desirable to send away from home in winter is a climate in which they can live out of doors in the air and sunshine, and even remain out at sunset without risk.

To ensure these advantages, without invading the tropics, we must look to Northern Africa, or the semi-tropical islands of the Atlantic.

About a day's sail from Madeira, three days from Cadiz, and not very far from the African coast, are to be found the group of islands known to the ancients as the "Isles of the Blest," and to us as the Canary Islands.

Of these seven islands, two—Teneriffe and

Grand Canary—have become formidable competitors as winter resorts with the Riviera, Egypt, and Algiers. English travellers described in glowing language the advantages of the climate and loveliness of the scenery. English invalids soon sought a region where there is *absolutely no winter*, and English enterprise provided excellent hotel accommodation for the influx of visitors. The Spanish Cortes voted a sum equal to about £5,000 per annum as a subsidy for a line of Clyde-built steamers to ply between the different islands. These steamers have good passenger accommodation, and are fitted with the electric light.

The large mail steamers of the Shaw-Savill, New Zealand Shipping Company, and the Union Company now carry passengers from Plymouth and Southampton to Teneriffe in five and six days; whilst Elder Dempster's African liners make the passage from Liverpool, calling at Madeira, in eight days.

Teneriffe, the largest of the Canary Islands, has enjoyed a reputation as a health-resort from a very remote period. Belcastle, Jaccoud, the late Dr. Victor Perez, Dr. Thurston, and others have pointed out its exceptional advantages for invalids in winter, and, after the brilliant letters of Mr. Ernest Hart, which appeared in the *British Medical Journal*, Orotava found itself famous.

Whilst all the islands of the Canary group are favoured with a semi-tropical climate, there are considerable local modifications, owing to the prevailing winds and ocean currents. The fresh and cool north-east trade-wind tends to keep the eastern portion of the Canaries comparatively dry, and the warm winds that blow direct from the Sahara also exert a drying influence; whilst the Gulf Stream, which exerts such a humid influence on Madeira, washes the Western Islands, and tends to make them less dry. The annual rainfall at Madeira is estimated by Dr. Grabham at 29 inches; that at Teneriffe only averages 14·7 inches.

Santa Cruz de Teneriffe, where passengers

land, has abundance of sunshine, few wet days, and great equability of temperature. Invalids seldom remain in the town, but they may obtain all the advantages of this side of the island at an elevation of some 300 feet on the slope of the Anaga Mountains. Here, within a quarter of an hour's drive of the landing-stage, are some pretty villas situated amongst palms and orange trees, and surrounded with tropical and sub-tropical flowers and fruit trees.

At "Salamanca," where invalids are received *en pension*, I saw a coffee grove of great beauty and some fine specimens of tropical vegetation. The water here is brought direct from the Anaga Mountains by an aqueduct, and stored in a large covered stone tank; this arrangement, common throughout Teneriffe, should, if properly carried out, ensure a plentiful supply of pure water for drinking purposes.

Santa Cruz being, unlike Madeira, a free port, there is no difficulty about baggage, which is cleared by the hotel agents and forwarded to its destination.

Though the currency of the island is of course Spanish, English, and sometimes only English, money is accepted at the English hotels. Teneriffe has a population of about 105,000, distributed amongst two cities, four towns, and a number of villages. Santa Cruz is essentially a commercial town, its harbour receiving the mercantile marine of all nations, and occasionally vessels of war.

In the background lies a series of volcanic rocks towering above the rather picturesque town of white houses, many having azoteas, or flat roofs, as in Eastern lands.

Here in Santa Cruz we are able to understand something of the indolent traditions of Spanish life and character. Looking out from my balcony I see two Señoritas lazily lolling out of window talking to a youth idling in the street. "El Barberia" lounges at his door awaiting hirsute chins, which, like Spanish words when wanted, do not always come. Beggars sit upon the door-steps exhibiting



their various deformities. The fruit-sellers appear to be mostly asleep, like the dogs that lie about undisturbed in the sunshine. Everybody is willing to do anything "mañana" (tomorrow). Things rarely happen here, where it appears to be "always afternoon." In the Plaza de la Constitution there is a marble cross erected by the Guanches. The volcanic rocks rise above the house-tops and "azoteas," where young maidens sit and yawn behind their fans. Bells are constantly going for some church-function, and occasional processions pass along the streets, priests and followers chanting, whilst the people wake up and do reverence. Upright Spanish women walk barefoot with loads upon their heads, whilst stalwart men lounge about the doors of cafés and tobacco shops, clad in simple shirts and drawers.

At the "Libreria" over the way one or two "Caballeros" scan the "Dinario de Tenerife," which contains the dates when the mails and steamers should come and go.

All this contrasts strangely with what may be seen in England upon a February afternoon, and yet it is only five days distant!

Teneriffe is about fifty miles long and twenty-five broad, comprising one of the most magnificent masses of mountain in the world. The peak, rising to 12,800 feet, is not difficult of ascent, and commands magnificent views. Many other mountains exceed 8,000 feet in elevation, and afford abundant opportunities for those who are able and ambitious to climb. Considerable variations in climate are attainable within a radius of a few miles.

At Icod, about 800 feet, at Villa-Orotava, about 1,000 feet, and Laguna, about 2,000 feet, there are comfortable hotels. The "carreteras," or high roads, are excellent, but some of the by-roads and "barrancas," being composed of broken pumice-stone, are trying even to the horses and mules of the country.

It is difficult to imagine anything more delightful than the drive from Santa Cruz to Orotava, about twenty-four miles. At first the

road ascends steadily, the Atlantic being visible on the right. Terraces are made for sustaining the soil, like the hanging gardens of Grenada, where the islanders may be seen at work. A level is formed on the side of the mountains by building walls of lava, which support a platform of earth a few yards wide, much as may be seen in the Rhineland steeps for the cultivation of the vine.

From the mountains streams of water are constantly flowing, to supply the tanks to be found in every garden. Occupiers of land are only entitled to a certain allowance of water daily for irrigation purposes.

At Laguna the temperature is much cooler than at Santa Cruz; it is, therefore, necessary to be provided with wraps. Many invalids and others come up to Laguna from Santa Cruz and from Orotava to avoid the summer heat. There is an excellent hotel, "The Arguere," managed by an Englishman.

"Laguna," or the city of "San Cristobel de la Laguna," is the seat of the Archbishop, whose palace may be seen. The monasteries and nunneries have been closed, but there is a library of some 15,000 old books contained in a very interesting old building. Here may be seen one of the finest dragon-trees upon the island. The walks and drives around Laguna are picturesque and interesting, but there is too much rain to admit of invalids remaining here in winter.

*(To be continued.)*

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THE PURIFICATION OF IMPURE WATER can be effected by precipitating the minute organic matter contained in it, by shaking it up with iron filings, while a current of air is passed through the liquid. The chemical action brought into play is that the iron filings, when in contact with the air, undergo oxidation, the oxidised iron next acting upon the organic matter which thus becomes oxidised. In a similar manner the advantage of a method in vogue amongst the natives of South Algeria and Cochin China may be explained. A small portion of alum is added to the impure or doubtful water; this is then shaken up, allowed to stand for a short period, and the clear, upper portion of the fluid poured off.

## THE TEACHING OF THE LAWS OF HEALTH IN SCHOOLS.

By ARTHUR NEWSHOLME, M.D., D.P.H. Lond.,  
Medical Officer of Health for Brighton.

MEDICAL officers of health and sanitary inspectors are now appointed in every district, whose duty it is to enforce every precaution against the spread of disease, and the removal of local conditions which tend to occasion disease. For this purpose various Acts of Parliament exist. Their enactments cannot, however, be enforced without the cordial support of the local authorities, which are elected by the public, and are, in fact, a reflex of public opinion. It is evident, then, that in order to insure steady sanitary improvement, the public must be educated up to the necessary point.

*How to reach the Public.*—Without doubting the desirability of popular instruction in hygiene for adults, and especially for women, I am convinced that our main hope for the future lies in the education of the children, of whom the major part are in attendance at elementary schools, voluntary or board. Twenty per cent. of the total population is on the registers of public elementary schools, and it is evident that if each of these scholars received an elementary course of instruction in the laws of health, in comparatively few years an immense amount of useful knowledge would be diffused, which must have a most beneficial effect on the health of this country.

*Economical Aspect.*—Most persons can appreciate an appeal which is made to monetary considerations; and even on this ground it can be shown that the present lack of knowledge of sanitary matters on the part of the public is the cause of serious loss to the community. Although the days when infection was regarded as a mysterious visitation, for which fasting and humiliation of spirit were the remedy, and not isolation of the patient, are nearly gone, yet every medical officer of health meets daily with

cases in which nothing but gross ignorance can account for culpable indifference to the spread of infection. During 1890, 6,537 cases of scarlet fever were admitted into the hospitals of the Metropolitan Asylums Board. These probably represent about 62 per cent. of the total number of cases of this disease occurring in London. As each case of scarlet fever costs on an average £1 4s. 9½d. per week for maintenance in hospital, and as a majority of the cases would have been avoided had the early cases been isolated at the first onset of the disease and kept isolated throughout, it follows that a large proportion of the £56,722 which was spent in the medical treatment and nursing of these cases of scarlet fever might have been saved.\* The amount spent in the treatment and isolation of this one disease in the whole of England and Wales, during the year 1889, cannot, on a moderate estimate, have been less than £383,000. And yet scarlet fever is the disease in which, perhaps, more than in any other, except small-pox, the importance of precautions against infection is realised by the public. In measles, whooping cough, and diphtheria, carelessness is general, and the loss of life and the expenditure of money which result from this carelessness are enormous.

*Hygienic Aspect.*—We are all familiar with the great saving of life that has occurred during the last fifteen years from the lowered death-rate which has prevailed; a saving of life which has occurred chiefly at the useful periods of life, and which is undoubtedly due in a very large measure to the improved conditions of life which have followed on sanitary reforms. That we have not reached the limits of possible improvement is evidenced by the large number of deaths from infectious diseases and from tubercular diseases which still occur, but which are entirely removable by isolation of the infected sick, and by the avoidance of overcrowding and dampness.

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\* The figures would, of course, be still more striking if the returns for the current year could be given



Perhaps one of the most fertile causes of disease is the improper feeding of infants. The story of the ravages of rickets, a purely dietetic disease, has not yet been completely unfolded ; but it is known to be directly or indirectly one of the commonest causes of deformity, disease, and death amongst children. Infantile diarrhoea, which each summer causes a large wave of mortality, is chiefly due to contaminated food ; and this, like rickets, might be almost abolished from our list of diseases if instruction in the laws of health were given in our schools, and subsequently carried out in practice. Many other instances might be given.

The saving of life which is still possible by a more general knowledge and application of the laws of health is not the only gain which would follow. The avoidance of sickness is, perhaps, even more important than the saving of life, especially when viewed from an economic aspect. We often hear it said that the diminished loss of life from epidemic diseases is far from being an unmixed good ; for weakly children, who would in former days have died, now survive to drag on a miserable existence, and lower the general average of health in the community. This statement is altogether erroneous ; for, in the first place, epidemic diseases by no means exclusively or chiefly attack weakly persons ; and, in the next place, this line of reasoning entirely overlooks the essential fact that, for every person killed by an infectious disease, there is a much larger number of persons who survive, but whose health is permanently impaired to a serious extent. There are maimed in the battle of life as well as killed, and, by diminishing the number of the latter, we, to an even greater extent, diminish the number of the former. There is still an enormous amount of sickness and mortality in this country which might be prevented by the practical application of the laws of health in daily life ; an end for the attainment of which I can see no more certainly and permanently efficient means than the instruction in the laws of health of the senior scholars in all

our schools. Let us examine to what extent this is already being done.

*What is being already done.*—It is possible that in isolated instances instruction in the laws of health may be given, of which we have no record, though it is fairly certain that this is not done to an appreciable extent. Hence, we may take the instruction given in connection with the Education Department and the Science and Art Department as a measure of the total instruction in this subject given in Great Britain. I need not stop to discuss the value of the examination test of knowledge which is made by each of these departments, though I have a strong personal opinion that, notwithstanding the drawbacks, the test by examination is the best hitherto devised, and is, in fact, the only practicable test. Now, the Science Department examines persons of all ages in hygiene ; and as an assistant examiner in this subject, I am able to speak with some knowledge of the work which is thus being done. But the total number of candidates in this examination, from all parts of Great Britain, is, as yet, under 5,000 a year ; and it is evident, therefore, that the effect upon the community of the instruction thus tested must be somewhat limited in extent.

We may next take the instruction given in hygiene in elementary public schools. The annual return of the Education Department shows that while 88,354 scholars were examined during 1890 in the various specific subjects enumerated below, only 611 were examined in "other subjects," a heterogeneous group which includes book-keeping, German, hygiene, social economy, and Welsh. The number embraced under this group who were instructed in hygiene may be summarised from the fact that under the London School Board hygiene was taught only in one single school, the number of passes obtained being fourteen.

*Number of Scholars examined in various Specific Subjects in the Elementary Schools of England and Wales during 1890 :—*

Algebra, 30,035 ; Euclid and mensuration,

997 ; mechanics, 11,662 ; Latin, 360 ; French, 7,232 ; animal physiology, 15,842 ; botany, 1,830 ; agriculture, 1,228 ; chemistry, 2,007 ; sound, light and heat, 1,183 ; magnetism and electricity, 2,293 ; domestic economy, 23,094 ; other subjects, 611 ; total, 88,354.

The number of school departments in which boys were taught musical drill was 1,414.

The number of school departments in which girls received instruction in cookery classes was 1,554.

The number of girls examined in domestic economy was 23,094.

Chemistry and physiology may be so taught as to have practical utility in daily life. It is only right to state, however, that the syllabus in physiology is such as insures the maximum amount of technical detail and the minimum amount of instruction in the vital functions of the body and their bearings on health. Cookery is an important branch of hygiene, and one can only regret that so small a percentage of scholars receive instruction in this subject.

Apart from making the laws of health a compulsory subject of instruction in schools, it would be voluntarily taught to a much greater extent than at present were the teachers themselves taught this subject. I am aware that the official answer to this is that female pupil teachers and candidates in training colleges must pass examinations in domestic economy, and that for male candidates school hygiene is included in the syllabus of school management. These examinations are, however, much too incomplete and imperfect to meet the requirements of the case. Students resident in training colleges are taught one or more of the following science subjects :—

Agriculture, physiography, mechanics, sound, light and heat, chemistry, electricity, botany, or animal physiology ; and the result is that they choose out of this list the specific subject for their scholars. If hygiene were once raised to the standard of a compulsory subject of study

in training colleges for both males and females, the battle would be won, and we should speedily find that instruction in the laws of health would become general in the elementary schools. Even before entrance to the training college the study of hygiene appears at present to be specially discouraged. It is one of the rules of the Education Department that a previous success in one or more of the list of science subjects just given entitles candidates, on their examination for admission to a training college, to a certain addition to their marks, and helps to raise their relative position in the "scholarship list." Hygiene is conspicuously absent from this list, and if a candidate were to pass in hygiene it would in no wise help his position. It is evident that this state of matters urgently calls for improvement.

To sum up : having regard to the facts that at the present time there is an enormous amount of preventible sickness, with its concomitant pecuniary loss and distress ; that the chief cause of this waste of life and money is the ignorance and apathy of the general public in hygienic matters ; and that little is being done to insure that the next generation shall be lifted out of the present state of ignorance, I venture to urge : (1) That the study of the laws of health should be encouraged, and, if need be, enforced in all schools ; (2) that, as a preparation for this, all teachers should be required to undergo a course of instruction in the laws of health. In conclusion, I append a scheme of a suggested course of instruction in the laws of health for use in schools. It will be noted that in this scheme I have attempted to interweave physiological facts and their hygienic applications. Unless hygiene is taught on a scientific basis, the instruction given must be superficial, easily acquired and easily lost. The only sound practical knowledge is that which is founded on scientific theoretical principles. Hence, although the introduction of technical terms is to be deprecated in the teaching of physiology for this purpose, I am convinced that in all useful teaching of the laws of health the



elements of physiology must bear an important part.

*Syllabus of Proposed Course of Study.*—A. Preliminary review of chemical facts, and of general structure of the body. B. The blood and its circulation. C. The digestion of food :—(1) The process of digestion ; (2) the varieties of food—animal and vegetable food, vegetarianism, milk and its derivatives, mineral foods, condiments ; (3) the preservation and cooking of food ; (4) beverages—tea, coffee, alcohol, &c. ; (5) water—sources of water, contamination of water, purification of water. D. Removal of impurities :—(1) Respiration—structure of respiratory organs, mechanism of respiration, chemical changes produced in the blood and in air ; composition of air—impurities of air, importance and methods of ventilation ; (2) the skin and kidneys—structure and functions of the skin, importance of cleanliness, baths and bathing ; (3) ash refuse and sewage, the essential points of house drainage, use and abuse of dust-bins, &c. E. Maintenance of warmth :—(1) Clothing—relative value of different materials, requisites of clothing, injurious fashions ; (2) the house—means for securing its dryness, lighting and warming of house. F. Personal hygiene—exercise, rest and sleep, habits. G. Local conditions affecting health—climate, winds, varieties of soil, drainage of soil, aspect and elevation of house. H. The immediate treatment of wounds and accidents.

SCORPION STINGS are dangerous, as well as painful, and the ordinary means of treatment—such as the application of ipecacuanha poultices—are of uncertain character. It will, therefore, interest our readers in India, and other parts where scorpions exist, to learn that Dr. Banergie, of Pachbudra, Rajputana, has found great benefit from the application to the affected limb of stupes containing three parts of chloral to one of camphor, the action being rendered more rapid by puncturing the skin with a needle previous to applying the medicament. In twenty severe cases treated in this manner, all pain quickly disappeared, the swelling commenced forthwith to abate, and the patients speedily got over the effects of the stings.

## PATENT MEDICINES.\*—No. 15.

OUR CORRESPONDENTS AND CRITICS ; UNQUALIFIED PRACTITIONERS ; “ A MERCIFUL MEDICINE MORE PRECIOUS THAN RUBIES ; ” “ OH, DEAR ! WHAT CAN THE ‘ MATTEI ’ BE ? ”

“ Man is a dupeable animal. Quacks in medicine, quacks in religion, and quacks in politics know this, and act upon that knowledge.”—SOUTHEY.

QUACKS in medicine have had their feelings considerably disturbed by the revelations contained in this series of articles, if we may judge by the abusive letters, occasionally varied by threats of action for libel, that have reached us. As regards the former, always anonymous, the attention we have bestowed on them has extended as far as our waste-paper basket ; while the threats have been as vague and incomplete as the analyses published have been positive and definite. Whenever our angry correspondents think fit to put their threats into tangible, business-like form, we shall be prepared to prove up to the hilt every statement we have made ; but we fancy that they are not so courageous, or so ill-advised, as Oliver Twist was when he asked for more. In fact, some of the patent medicine people seem to have had too much already. One patent medicine company, to whose remedies (!) we gave gratuitous, though world-wide, publicity, has lately held the annual meetings of its shareholders, and the directors have had to explain that the great falling of receipts, and consequent shortness of dividends,

\* The articles on this subject, which appeared in *HYGIENE* for 1891, have been reprinted and published in book form under the title of “ Patent *alias* Quack Medicines ” ; 3rd edition, 128 pages, price 1s., post free for 14 stamps. (Beaumont and Co., Limited, 39, Southampton Street, Strand, London.) During the present year articles have appeared on Beecham's Pills, Warner's Safe Cure, Morrison's Pills, Baillie's Pills, Dixon's Pills, Lee's Pills, a Quack Libel Case, Modern Mysticism and Mattei's Electricities, Nicholson's Patented Artificial Ear Drums, Electric Belts, St. Jacob's Oil, the Gold Cure for Drunkenness, etc.

are due to the influence of efforts used to stop the sales of their "marvellous medicines"; while, as regards another company, whose sheet-anchor is, as our published analysis proved, only salt-petre, the *Financial Gazette*, of October 15th, says of it, that the shares have dropped so low as to be "practically unsaleable."

Whatever the views of patent medicine makers may be, there is, at any rate, a remarkable consensus of opinion amongst the Press, and we are constantly receiving papers containing most favourable, indeed flattering notices of "Patent *alias* Quack Medicines." We regret that our limited space prevents our acknowledging all of these; let one suffice as a specimen. Our excellent contemporary, the *British Medical Journal*, of October 1st, says:—"The editor of HYGIENE has for some time past devoted himself to the task of exposing the later forms of medical quackery; and in this interesting book we learn all that the analyst has to tell us about these loudly-trumpeted preparations." The reviewer concludes as follows:—"As a contribution to our knowledge of the ways of quacks, it is to be welcomed; and we hope that all of our readers will make it their business to acquaint themselves with its contents."

Extracts from letters referring to our reprint, from correspondents living in Great Britain and abroad, would alone fill our present number. Here, also, we must ask to be allowed to give a single specimen. A gentleman holding a high judicial position in India writes:—"I have just finished reading, with great amusement and profit, your delightfully humorous and powerful *exposé* of quack medicines. I am glad to find that the articles continue to appear in HYGIENE, and I congratulate you upon the good work that you are doing." Many of our correspondents are medical practitioners, who inform us that they have succeeded in promptly and effectively opening the eyes of believers in this or that nostrum by putting in their hands a copy of HYGIENE, or the reprint to which the judge refers in his letter quoted above.

Reading through the quotation from Southey, we are reminded of a curiously-worded card which was put into our hand some time ago, in Fleet Street, near Ludgate Circus. It runs thus:—"Admit the bearer to a free consultation on deafness and noises in the head and ears, with the London specialist, the Rev. E. J. Silverton, now returned from a long tour through Glasgow and all the large towns of Scotland; Liverpool and all the large towns of England; also Ireland and Wales, where wonderful cures have been performed without operation or the use of instruments. The treatment is so gentle in its action, that little children are often saved from being Deaf and Dumb; and some who were deaf and dumb have been made to hear, and then taught to talk. Old standing cases are also successful"—the language is as mysterious as the gentle method—"indeed, it seems no more difficult to cure at seventy-two than at seventeen. The patient should not be discouraged because he or she has tried before and failed. Mr. Silverton has been in the *work* over twenty years"—this expression smacks rather of the parson than of the physician—"and has been eminently successful"—just now the cases were successful—"in all kinds of cases"; here followeth, to employ the clerical phraseology, a long list of ailments, which we need not inflict upon our readers. "If the case is incurable no hope will be held out, but valuable advice will be given to each sufferer"—"given" has a philanthropic sound about it—"and where there seems to be hope remedies will be recommended." "CAUTION"—we must put this word into capitals, as on the card lying before us, although we could not spare capitals enough for all the words thus printed. "Caution," we say; but we will give the reverend specialist's language, not our own. "Patients may bring one friend, but we have not room for four or five people to come with one." It seems a singular thing that four or five people should even wish to accompany, much more that they should, unless strictly prohibited, accompany every individual patient to a consultation.



We have been in practice nearly twice as long as the reverend specialist has been "in the work," and we can only remember a single instance of four persons entering our consulting-room with one patient. On this exceptional occasion, the patient was suspected to be of unsound mind, and the quartet accompanying him, being composed of near relatives, may have regarded it as a good opportunity for getting an indirect tip at his expense as to their own mental condition. But, surely, the reverend specialist's visitors are not all afflicted with suspected weak intellect; rather let us suppose that they are actuated by a burning desire to see him "on the job"—"in the work," we mean. However, those who are shut out by the reverend specialist's imperative order need not, like Moore's Peri, in "Lalla Rookh," "at the gate of Heaven sit disconsolate." The reverend specialist has made arrangements for their supply with his patent pills and other patent remedies, which, similarly to his treatment of deafness, would appear to be equally well suited to the patient's case, whether seventeen or seventy-two years of age, or of either sex. At any rate, we have our reasons for this supposition. We happen to know that some years ago, in the same week, two people, a gentleman and a lady, consulted the reverend specialist in consequence of seeing his advertisements in the newspapers; the gentleman seeking advice for rheumatism, the lady for sterility of many years' duration, a condition which she was anxious to have remedied, if possible. In accordance with the reverend specialist's rule that, "where there seems to be hope, remedies will be recommended," the lady received medicine as well as the gentleman. In the gentleman's case thirty-five shillings were demanded for what would be dear—commercially speaking—at thirty-five farthings. The pills and mixture supplied to each were examined by a public analyst, and in each case the remedies were identical in composition; the mixture being composed of water, chloride of iron, acetate of ammonia, and syrup of orange to flavour and

colour it, while the pills were merely common rhubarb pills. Yet these very ordinary pills were described by the reverend specialist in one of his pamphlets as "a merciful medicine, more precious than rubies"! Presuming that this is a fair sample of what people get when they visit the reverend specialist's consulting rooms, where he can be seen, with "his physician in attendance," it would be a difficult question to decide which is the more simple, the patient or the treatment. The object of the reverend specialist in associating with himself a medical man holding some qualification or other is obvious—namely, to evade the law relating to unqualified medical practitioners. But if the Medical Council, whose duty it is to protect alike the interests of the profession and the public, would exercise the power vested in them to its full extent, such a state of things could not exist as that of an unqualified man, boldly announcing himself to be possessed of special knowledge, far beyond that of others who have devoted their lifetime to medical study, and as boldly practising, under the cover of an alleged doctor, whose very name is suppressed. Judges, coroners, and magistrates are properly severe when cases come before them in which unqualified medical assistants have attended patients; is not the case of a qualified medical man with an unqualified associate as his employer still more deserving of reprobation? As a matter of fact, the Medical Council have it in their power to deal with cases of this nature, under the Medical Act of 1858. Indeed, they sometimes exercise this power. Last year, two practitioners were struck off the Medical Register, the charges proved against them being that they had carried on practice in conjunction with, or acted as cover for, unqualified persons.

In a pamphlet largely circulated by the reverend specialist, it is stated that, prior to commencing his present career, he was a Baptist minister. But, "pressure of pastoral duties and the very wide range of his healing ministry"—

wider, apparently that his range of drugs, or acquaintance with the properties of those he did use—"compelled him to retire from either the one or the other. Mr. Silvertown has retired from the pastor's office, to the great regret of many hundreds of warmly attached friends constituting the Church meeting in Exeter Hall, Nottingham. It seems as sacred to give a man health as to bless him religiously; but often the one leads to the other." As the reverend specialist probably wrote this modest eulogium himself, we will content ourselves with expressing the sincere hope that none others besides the "many hundreds of warmly attached friends" have had reason to greatly regret his change of vocation.

Before concluding this article, we take the opportunity to express our thanks to the Agent-General for Victoria, for his kind courtesy in forwarding to our office a copy of the Medical Act, 1890, passed by the Victoria Legislature, with the object of consolidating the law relating to medical practitioners, dentists, and chemists in that colony. A perusal of it shows that, in some respects, the law as regards unqualified practitioners is more stringent in Victoria than in the mother country.

"Oh, dear! what can the *Mattei* be?" The *Star*, of October 25th, has the following startling announcement—really, we are so upset, that we must ask our readers to excuse this pun. As the lady said, in extenuation, when taken severely to task about an unexpected increase in the population, "It is but a little one." But how about the announcement? That is big enough, surely:—"The *Mattei* Controversy.—Count *Mattei*'s solicitors, Messrs. Colyer and Colyer, say that the Count has determined to defend his medical system against the attacks which have lately been made upon it by numerous English journals, and that a writ for an action for libel has already been served upon one of them." Can this eleventh-hour activity in any degree account for the brisk demand at HYGIENE office lately for certain back numbers?

THE EDITOR.

## THE LAW OF LONGEVITY.

By NATHAN ALLEN, M.D., LL.D., formerly President, American Public Health Association.

(Concluded from page 308.)

*Advantages of the Law of Longevity.*—The question may very properly be asked, "Supposing there is such a law of longevity, what are its advantages?" We answer, many and great. It is not a mere speculative theory or vague hypothesis that cannot be comprehended or applied to any practical purpose. It harmonises not only with all the well-known truths of physiology and pathology, but is sustained by all the agencies employed by nature or art for the protection and preservation of life. In fact, it is that great general law established by the Creator for perfecting and prolonging the life of every human being, of which all minor laws are a part and parcel. It holds up before us that perfect form and image in which man was created, and presents an embodiment of those laws and conditions with which we must comply in order to secure the greatest amount of happiness and the longest duration of life. With such a standard constantly before us, shall we not make greater efforts to conform to it than if we had no such conception? Besides, by means of understanding the various deviations from this perfect standard, we obtain a better knowledge of the infirmities, the liabilities, and the weaknesses of the human system. It presents a new standpoint from which to survey the causes of disease, as well as the agencies employed for its cure and prevention. It gives us a clearer and better understanding of the principles of hygiene and sanitary laws, and enjoins the absolute necessity of observing them, if good health and long life are to be secured. It shows that all the changes which occur in the human system are subject to law; that disease, of whatever type and character, or wherever found, is a violation of law; and all treatment and remedies, whether



provided by nature or art, must be viewed as agents, or means to repair the injury.

*Applied to Life Insurance.*—But there is one use to which this law may be applied, of incalculable value. I refer to life insurance, in connection with which this law may be applied with great success.

In the examination of any organic structure with reference to forming an estimate of its continuance, we must understand correctly its nature and construction, as well as the laws that govern its action. If it is made up of many parts or distinct organs, we must comprehend fully their relations to each other and to external objects. But in order to make the best use of such knowledge, and form an intelligent estimate of results, we want some general law or standard of appeal which shall be applicable to the whole. To anyone acquainted with the earlier history of the different sciences, it is well known what great advantage was found when a large body of facts or amount of knowledge had been obtained, so that by the discovery of a general principle all these facts and this knowledge could be more systematically arranged, and satisfactorily explained. It is somewhat so in applying this law of longevity to life insurance, though it may be subject to many conditions, and cannot be reduced to mathematical accuracy.

*Pre-requisites of Longevity.*—Without explaining again this law and its conditions, let us briefly notice some of its applications in determining the prospect of continuance of life. All the essential elements or pre-requisites for longevity may be conveniently arranged or summed up under three distinct heads—viz, *constitution, heredity, and conditions of health.*

1st. *Constitution.*—It furnishes the examiner for life insurance with a standard of organisation, with which the constitution of all persons examined may be compared, and which will assist in forming a correct judgment of their soundness, or in detecting the physical deviations from a normal standard; then, what are

the liabilities to disease, and what the probabilities of life. Without such a standard or guide we have no general rule to test the soundness or strength of the constitution. It must depend very much upon opinion merely, which, of course, will vary according to the differences of judgment in different individuals. With such a model constantly before us as nature has furnished, we can understand more exactly and fully the relations which all parts or organs of the body sustain, one to another, as well as to external nature; and then we can calculate or forecast better the changes to which they may be subjected. The more we possess of such knowledge, the more accurately can we estimate the prospect of continuance of life.

2nd. *Heredity.*—All writers upon life insurance lay great stress upon heredity or long-lived ancestry. This has been found by universal experience to be one of the pre-requisites—in fact, an indispensable condition of long life. Now, why is this so important? What is the rationale of it, or what lessons does it teach? Does it not clearly and distinctly imply that if there is any truth in this power of inherited organisation for long life—the more perfect the organisation, the greater the power—there must certainly be found, somewhere in nature, a great general law of longevity? The influences of hereditary descent have as yet received but little attention, compared with their importance, even from the medical profession, and before they can ever be thoroughly understood, it will be found, if we mistake not, that there exists in physiology, as a fundamental principle, a general law of propagation; and, as a part and parcel of the same, will be found also this law of longevity. In the matter of life insurance, a thorough knowledge of these hereditary influences is of the utmost importance.

3rd. *Conditions of Health.*—Obedience to the laws of nature. This has a very wide application, including all the physical laws, and the relations of body and mind. The better these

laws are understood, and the more strictly they are observed, the greater will be the amount of health, and the longer human life. But in order to effect this most successfully, the conditions of good health must first be fully understood, such as pure air and water, wholesome food and drink, healthy vocation and residence, regular hours of exercise and sleep, temperate habits, right mental and moral culture, with a cheerful, contented disposition.

With the increased knowledge and observance of these laws of health, many individuals have not only prolonged their lives, but the average duration of human life has considerably advanced. But physiology, in its practical applications, is yet in its infancy. When its principles become so thoroughly understood and appreciated as to be practically applied throughout the community, in every family, and by every individual, then will be found a great diminution of disease, as well as of early mortality. Now, by having a true standard of organisation for testing a good constitution, and by understanding correctly the laws of hereditary descent, it gives us new and more definite views of the various conditions of health. In the examination of persons for life insurance, all these laws or conditions must be taken into account, and after careful and thorough investigation, it will finally be found that all these principles and conditions operate in harmony with, and are based upon, one great general law in nature—the law of longevity.

The question may still be asked, "Wherein, and how, can this law be made practical?" To answer this question fully would require a volume. Only two or three more suggestions can be offered here.

It points out directly the true means or sources of health and life; that there is no chance or mystery in them, but that they are all governed by laws which can be understood and obeyed. It expounds correctly the great laws of heredity which furnish the ground-

work, the pre-requisites for good health and long life. It explains the absolute necessity, in the outset, of a sound constitution, of a well-balanced organisation. It shows the relation and importance which human agency holds in propagating a sound and healthy stock. It teaches every individual more clearly what are the peculiarities and weaknesses of his own constitution, as well as what are his particular liabilities to disease. It is this exact, this definite and personal, knowledge that may be turned to the greatest account in the prevention of disease. If every individual in the community could be thus made acquainted with his own physiology, together with the laws of hygiene, we should soon see a most surprising difference in the relative amount of sickness, as well as of early mortality.

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### PUBLIC HEALTH REPORTS.

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*Battersea.*—The populous parish of St. Mary's, Battersea, is divided into two districts, named respectively East and West. Both of these are largely inhabited; East Battersea containing more than 67,000 people, while West Battersea had upwards of 83,000 inhabitants at the 1891 census. Of the former, Dr. W. H. Kempster is the Medical Officer of Health, and Mr. Joseph Oakman has for twenty-three years occupied a similar position in West Battersea. The Report under notice contains a joint report for the entire parish by these two gentlemen, and a separate one by each concerning the division of which he has special supervision.

The census taken on April 6th, 1891, showed the population of Battersea to be 150,458, being an increase of no less than 43,196 over that of 1881. Few places, whether in the Metropolis or any other part of the United Kingdom, could show such a large, progressive increase of its inhabitants as is evidenced by the following statistics of Battersea:—In 1861, number of inhabitants, 19,582; in 1871, 54,847; in 1881, 108,342; and in 1891,



150,458, as already stated. In short, the population has increased nearly eightfold in the comparatively short period of thirty years. It is satisfactory to learn that with this enormous increase there has been, thanks to the ability and energy of the sanitary officials, to the greater interest of the public in hygienic matters, and to more efficient sanitary legislation, an appreciable improvement in the mortality rates. The death rate, which was 25·7 per thousand in 1861, and 26·8 per thousand in 1871, fell to 18·7 by the end of the following decade (1881), while it had undergone a further reduction, last year, to 17·2. In the same twelve months the death rate of the whole metropolis was 21·4 per thousand persons living. Even with the addition of the deaths of all Battersea parishioners occurring at the various metropolitan hospitals and institutions outside the parish, the annual rate is brought up to only 17·7.

Of the zymotic group of diseases, whooping-cough caused more deaths than any other—viz., 102, epidemic diarrhoea coming next with 94; following these in order of mortality are two other affections, occurring, like the first two, principally at an early period of life, measles and diphtheria, causing 37 and 35 deaths respectively. There were 16 deaths from scarlet fever, and 18 from typhoid or enteric fever; small-pox caused only 1 death, and typhus fever 0. Yet, not many years ago, the last-named diseases were fearfully fatal in all of our large towns. As regards small-pox, the opponents of vaccination are actually advancing the general freedom from this horrible pest as an argument against vaccination, to which the immunity is in very great measure due. All that can be said of such ridiculous nonsense is that this argument is as good as any others put forward by them. With just as much show of reason it might be urged that as typhus fever, being a disease owing its origin to filthy habits, overcrowding, and other insanitary conditions, did not cause any deaths in Battersea last year,

it is now quite superfluous to take any hygienic precautions. "Let everyone follow his own devices, leave filth to accumulate, encourage overcrowding; where is the necessity of sanitary measures, seeing that not a single death from typhus was registered in 1891, amongst more than 150,000 people?" this is the style of argument which, to be consistent, persons who oppose vaccination, because of the improved state of things which have resulted from its general adoption, should indulge in.

Influenza and its complications were registered as the cause of death in 57 instances last year, but, as Drs. Kempster and Oakman point out, many of the deaths attributed to diseases of the respiratory organs, brain and nerve diseases, and affections of the heart and circulation, were doubtless due, in some measure, to the previous occurrence of influenza, thus rendering the sufferers more liable to fatal results than they would have been had not their systems been already depressed and their strength undermined by the illness from influenza.

The total number of cases of infectious diseases notified during the twelve months were 1,383, of whom 154 died, giving an average of 1 in 9. About one-third of these cases—viz., 460—were removed to the hospitals of the Metropolitan Asylums Board, where 72 of them died. This seems at first sight a large proportion, but it must be borne in consideration that such cases were of the greatest gravity, and frequently persons who had been badly housed and fed, and consequently in a condition favourable to their succumbing to any severe illness.

Drs. Kempster and Oakman, in connection with a revision of the different Sanitary Acts which came into force last year, observe:—"The whole tendency of recent legislation has been to broaden the basis of action of the various sanitary bodies, involving much additional labour and responsibility upon medical officers of health, and the sanitary staff generally." Such is the inevitable outcome of improved sanitary legislation, widening the area of opera-

tions, and necessarily adding largely to the duties and responsibilities of every official concerned. The chief of the Acts recently coming into law, as regards the Metropolis is, of course, the Public Health (London) Act; which, though it throws more work upon the health officers, at the same time does benefit by conferring important powers upon sanitary bodies. It is a great step in the right direction; sanitary legislation has hitherto been of a permissive character, but it is becoming compulsory. The word "may" has figured too often in the clauses of Sanitary Acts; and it has too frequently happened that members of sanitary boards have construed this term into permission to leave matters alone.

In their individual reports, both Dr. Kempster and Mr. Oakman have little, if anything, to say in favour of the metropolitan water supply, as affecting their important district. "It is much to be feared," writes Dr. Kempster, "that the water companies are unable to effectively filter the water supplied by them, owing to insufficient settling-tanks and filter-beds, more especially when the river (Thames) is in flood. There should be sufficient storage to obviate the necessity for taking in water during floods, when immense quantities of organic matter from farms, &c., are swept into the river, fouling the water, and rendering it unfit for consumption, and in a condition likely to convey disease." Mr. Oakman writes in similar strain:—"The water supplied to the district during the year has been anything but of a satisfactory character, and the reports of our able analyst, Mr. Cassal, have shown that it is quite unfit for potable purposes, and bears the characteristics of unfiltered water."

During 1891, the summary of sanitary operations in East Battersea shows that 11,484 houses and premises were inspected; 419 houses were disinfected and cleansed after infectious diseases; 1,075 houses were supplied with disinfectants; and numerous defects in drains, water supply, roofing, &c., were duly remedied. In West Battersea 11,729 houses

were inspected; 521 houses disinfected and cleansed after infectious diseases; 1,348 houses supplied with disinfectants; while the activity in discovering and setting right all kinds of sanitary defects corresponded with that displayed in the eastern division of the parish.

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*Lincoln.*—The city of Lincoln, to which Dr. Charles Harrison has acted as medical officer of health for the long period of a quarter of a century, contained at the 1891 census 41,491 inhabitants. The erratic ratio of the increase of population during the past thirty years affords a remarkable illustration of the errors which must frequently occur, when the population has to be calculated on the basis of the preceding intercensal period. Between 1861 and 1871 the increase was 5,771; and, as Dr. Harrison says, if the same rate had continued during the next decade, the figures would have stood at 32,680 in 1881.

But it happened, according to the census taken in 1881, that the actual population was 37,312, being an increase of 10,546. Again, had this same rate of increase continued between 1881 and 1891, the population would have been 48,115; but, as enumerated on April 6th, 1891, it was only 41,491, being 7,624 less than the estimate. Such a constant source of fallacy tends greatly to weaken the value of birth-rates and death-rates calculated for years falling between the intercensal periods, as we have frequently stated in *HYGIENE*, and the facts we have just mentioned fully support our contention that ten years are too long a period to allow to elapse between the census-takings. It would suffice to have an enumeration of the population only, made every five years, reserving the present arrangement of including statistics on all other points every tenth year. It is now officially admitted that ten years constitute too long an interval, for the Registrar-General, commenting on this question, has stated in his preliminary report on the census of 1891, presented to the Local Government Board:—



"Differences between estimates of this kind and the reality are unavoidable when the interval between two consecutive enumerations is so long as a decennium." The fallacy in the estimate of Lincoln was repeated on a larger scale as regards England and Wales, the estimated population for 1891 being 703,350 in excess of the actual figures.

During the twelve months ending on December 31st, 1891, the period dealt with in Dr. Harrison's report, 1,213 births were registered in the city of Lincoln—made up of the remarkably close numbers of 607 males and 606 females—and 784 deaths. Of these deaths, 274 were those of children under 5 years of age (196 of these being under twelve months); at the other end of the scale, 91 persons whose deaths were registered were between 60 and 70 years of age, 106 between 70 and 80 years, 50 between 80 and 90 years, while 4 had passed their 90th year, and were travelling on towards the completion of a century. It is seldom that one meets with such a large proportion of persons living to such advanced ages as is here recorded.

The mortality from the usual zymotic diseases was low—viz., whooping cough, 20; diarrhœa, 14; scarlet fever, 5; diphtheria, 3; typhoid fever, 2; and measles, 1. In the previous year, 1890, measles caused 28 deaths, and diarrhœa 29. An epidemic of diarrhœa occurring at the commencement of January, 1891, was clearly traced by Dr. Harrison to the water supply. It affected the residents in a district supplied chiefly from the River Witham, which had been frozen for some weeks. This water was turbid, had an offensive smell when heated, and contained a large excess of organic matter.

Influenza visited Lincoln in an epidemic form early in April, 1891, and gradually increased in severity until the middle of May, after which date it as gradually subsided. The number of deaths registered as due to influenza was 36, and, as is usual during the prevalence of an epidemic of influenza, many more than the ordinary number of deaths from different chest affections. "The

greater number of people attacked suffered from lung complication, and the disease was followed by an amount of debility and prostration quite out of proportion to the early symptoms." Dr. Harrison also observes that "influenza appears to have no connection with insanitary condition, all ages, sexes, and conditions of people suffered; in some instances whole families were attacked, whilst in others one member out of several would suffer, the others escaping." Further, "unlike the other infectious fevers, influenza does not, in any marked degree, or for any considerable period of time, confer immunity against another attack."

No diseased, unsound, or unwholesome food exposed for sale was seized during the year, but the inspector of meat condemned as unfit for human food 2,606 lbs. of meat, as against 5,078 lbs. in the previous year. Before being taken into the fat stock market, several live animals were offered for inspection and condemned as unfit for sale.

The rainfall during 1891, as recorded by Mr. J. M. Warrenner, of Skellingthorpe, near Lincoln, was 27·5 inches, being seven inches more than in the preceding twelve months, and two inches above the average.

Dr. Harrison is public analyst for Lincoln, in addition to being medical officer of health. Only a few samples of drugs were submitted by the inspectors under the Act; one of these was found not to be of the nature demanded, and the vendor was summoned before the magistrates and fined. Amongst private samples brought for examination was one of considerable importance in an agricultural district. It had been stated to consist of nitrate of soda, and the question put to the analyst was, "Does this sample contain 95 per cent. of pure nitrate?" It turned out to be ordinary washing soda, its commercial value being about seventy shillings per ton. Nitrate of soda was selling at the same time at ten guineas per ton, so that anyone buying this stuff would have been robbed by having to pay three times the value of the article, whilst the

land would have been robbed of an intended fertiliser, through a substance containing no nitrogen whatever being placed on it.

*City of London.*—In his recent report, Dr. Sedgwick Saunders, Medical Officer of Health, states that, judging from past experience, he believes that cholera is certain to occur in England next year, in an epidemic form.

He urges the removal of the public dust-bins, at present placed throughout the city, as they constitute a permanent nuisance and source of danger to public health, notwithstanding the constant attention given to them by the cleansing department. This arises, not so much from their legitimate use as from the practice of shopkeepers and other traders, depositing in them large quantities of trade refuse. Dr. Saunders suggests, in place of the public dust-bins, a resort to the skip system; which is much employed in many of the metropolitan sanitary districts. In that of Poplar there are 20,000 in use, in Bermondsey 15,000, and an immense number in Bethnal Green.

## THE PREVENTION AND TREATMENT OF CRIME.

THE Report of the Howard Association (named after the eminent philanthropist and prison reformer), dated October, 1892, contains a large amount of information concerning the treatment of crime, pauperism, and similar social diseases. Since the institution of the Association, with the assistance of the late Lord Brougham, it has done much good work in a quiet, unassuming way, and, we may add, at very little cost, the subscriptions and donations in aid of the Association during the past twelve months having been only just over £500.

The Probation of First Offenders Act, which was passed for the purpose of enabling magistrates to permit convicted offenders of previous good character to be at liberty during good behaviour, and which was especially designed to

diminish the imprisonment of young children (an objectionable and often cruel punishment), had, notwithstanding its salutary provisions, been greatly neglected in numerous districts. The Association directed their attention to this circumstance, and succeeded, through Mr. Samuel Smith, M.P., in inducing the Government to issue a circular on the subject to all magistrates in England and Wales. Another matter which the Association have had under their consideration is the inequality of sentences, in connection with which, as the Report states, they have received valuable assistance from the public press. Evidently, there is something radically wrong in giving heavy sentences for trifling thefts, while persons guilty of offences accompanied by gross brutality are sometimes let off with small fines, or absurdly inadequate imprisonments. Several cases of this nature, bearing out the truth of our remarks, have been reported lately. Yet, only on October 22nd, there appeared in the daily papers a paragraph headed "Four Years for Twopence." This extraordinarily heavy sentence was passed at the Middlesex County Sessions on the day before, the offence being an attempted robbery of 2d. from the till of a public-house. The prisoner had been convicted previously. A young fellow, twenty-two years old, who was with him at the time of the attempted theft, was sentenced to twelve months' hard labour, the two sentences making five years (at the ratepayers' expense) for twopence.

Some magistrates appear to be actuated by the same ideas as an old Essex farmer, who, happening to meet an acquaintance, told him that he had been engaged on the jury trying prisoners at the Chelmsford Assizes; adding, with the air of a man conscious of having done his duty, "We found 'em *all* guilty." Such a wholesale result surprised his friend, who interposed with the remark, "But surely some of the prisoners must have been innocent." "Ah!" replied the farmer, who had not looked at the matter in that light, "then why were they there, I should



like to know?" Human nature is fallible in the administration of the law as much as in anything else. "You are a sensible fellow," a gentleman observed to an old college chum, who had just been placed on the Commission of the Peace, "and your decisions will probably be right; but—never give your reasons." "And," he might have added, "do not allow yourself to be carried away by prejudice, or momentary impressions, into too severe a sentence when the criminal is very young, or the offence comparatively a trifling one."

The treatment of prisoners awaiting trial is one deserving of the close attention which it receives at the hands of the Howard Association. As their Report says, though more than twenty per cent. of the persons charged have at their trial proved to be wholly innocent of the offences for which they have been arrested, yet they have sometimes undergone months of confinement, waiting for the Assizes. Many of these are detained only through the poverty of their friends, and the consequent inability to obtain bail. Now, these unfortunates are kept shut up for twenty-three hours out of every twenty-four in a cell, only one hour's exercise daily being permitted; while there is no obligation, no inducement, and little facility for useful occupation.

The accommodation provided for prisoners in the various court-houses in England and Wales has for years been known to be flagrantly inadequate; old and young, hardened criminals and mere lads, are often huddled together in a small room, without any regard for sanitary requirements or common decency. At the Durham Assizes, last July, Mr. Justice Day raised his voice against such a state of things. "It is really a sad thing that there should be only one room for male prisoners, 28 feet long, 14 feet wide, and 11 feet high. Twenty or twenty-five males, many of them mere boys, there for the first time, some of the men old returned convicts, are all put there together, notwithstanding all the care which is taken in prisons to prevent

communication; huddled together, day after day, simply because care is not taken to provide proper accommodation whereby they can be kept apart." We hope that Mr. Justice Day's protest has roused the Home Office and local authorities to a determination to promptly remedy this important oversight.

There is much other matter of interest in the Howard Association's Report. We note a strong recommendation of the system of boarding out pauper children, in selected cottage homes, amongst the various influences for preventing crime and pauperism. The bringing up of children in workhouses and workhouse schools tends to make them, especially girls, dependent upon the routine life around them, ignorant of the money value of even ordinary things, unfamiliar with the humanising surroundings of home life, and unfitted for the simplest duties when they are sent out to domestic service or other employment. Moreover, they have impressed upon them the social stigma of "workhouse-bred." The boarding-out system has not yet been properly adopted, seeing that only 4,400 out of 52,000 pauper children in England and Wales (only one in twelve) are boarded out at the present time.

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THE WORKING LIFE A HAPPY LIFE.—Sir George Humphry, M.D., F.R.S., Professor of Surgery in the University of Cambridge, made the following remarks in his inaugural address at the Mason College, Birmingham:—"‘Man,’ it has been said, ‘is born to trouble as the sparks fly upward.’ Happily, there is a hereditary antidote to this inheritance, for it may be as truly said that man is born to work, and work is one of the greatest sources of his happiness. The work-a-day life is the happy life. Everyone has pleasure in work when he takes to it with earnestness. Pleasure in work is, therefore, a measure of earnestness in it, and, the better the work, the greater the pleasure. All power brings with it its measure of enjoyment, and to man is given, in addition to the animal power and the enjoyment of the body, the higher and greater power and enjoyment of mind and thought. The former naturally preponderates in early life, the latter at a later period; but both, as the Greeks felt, are necessary to make up the complement of the perfect man."

## Reviews and Notices of Books.

*Epidemics, Plagues, and Fevers: their Causes and Prevention.* By the Hon. Rollo Russell. 508 pages, demy 8vo. London: Edward Stanford. 1892.

THE author of this volume states in his preface that he has aimed at producing an epitome of existing knowledge concerning the nature and prevention of a class of diseases commonly spoken of as "preventable"; and as the result of careful research he has brought together from numerous sources a very large amount of information. Indeed, although he modestly styles his work a handbook of sanitary principles, it is one of which any medical writer might well feel proud to be the author. The careful, complete manner in which the facts have been collected, the able way in which they have been put together, and the admirable hygienic truths enunciated in clear, unmistakable terms, combine to render this volume a valuable addition to sanitary literature. It is an encouraging sign of the extent to which hygiene has engaged the attention of the educated class, that such a book as that before us should have been produced by a non-medical author, and that he should so deeply have studied the subject on which he has written.

Especially does the Hon. Mr. Russell dwell upon the necessity of universal education in the principles of hygiene; which he says, as we have often insisted in these columns, ought to form an essential part of our educational system. "While," he says, "we teach the children of England in compulsorily-attended schools the names of ancient and unworthy kings, or of rivers in South America, or of lakes and mountains in Asia, we still omit to teach in public or in private schools, to the young or to adults, many of the weightier matters which closely concern life, health, prosperity, happiness."

Elsewhere, he forcibly points out that "an educated voter may know enough to condemn the political rule of old Mesopotamia, or the follies of the Dark Ages, but he may nevertheless vote for a town councillor who builds pestiferous dens where fever always lodges, and who cares nothing for the powers we possess for the security of the people." Sanitary legislation up to a recent date has been too much of a permissive character, and consequently allowed to remain in abeyance by town councillors and vestrymen of the kind referred to by Mr. Russell, but there is now an evident tendency to make public health laws more stringent, as well as to facilitate their being put in force. Moreover, through improved knowledge the public themselves are becoming more alive to the desirability and necessity of efficient sanitation; and it is from such knowledge that we may expect permanent good results. As a contributor to the *Times* remarked in an article upon the International Congress of Hygiene held in London last year: "The most pressing work of sanitary reformers is now not so much to legislate as to educate; to make the mass of the people, in some degree, participators in the knowledge of the causes of disease which is possessed by men of science."

After dealing with the nature of spreading diseases in plants and animals, and showing the germinal origin of different parasitic conditions, and the methods by which they can be checked, Mr. Russell devotes nearly fifty pages to cholera, an epidemic which lately threatened this country, and has committed fearful ravages upon the Continent, particularly in Russia, where 300,000 persons have died of cholera during the present outbreak. Yet cholera is essentially a preventable disease. Dirt, overcrowding, impure water—these, and such as these, conditions are favourable to the development and spread of cholera. Who, indeed, can hesitate to recognise this fact, with the object-lesson of Hamburg before him? The causes being known and admitted, the mode of prevention evidently



consists in isolation of persons attacked by cholera, in thorough cleanliness, personal and general, disinfection, pure water supply, and wholesome food.

Consumption, or tuberculosis, is now regarded as being, to a considerable extent, a preventable disease. The chief predisposing causes are a morbid state of the lung tissue, through local irritation, weakness, illness, or hereditariness, aggravated by insanitary conditions such as the aggregation of many persons in too limited a space, insufficient or improper food, and breathing foul, re-breathed air. All that is then necessary to produce consumption in the individual is the presence of the tubercle bacillus itself—derived either from some human being suffering from the affection, or through using as food the flesh, or, more particularly, the milk of tuberculous cows—ready to thrive and develop rapidly in such favourable circumstances as we have mentioned. For many years the infectiveness of consumption has been recognised by Continental, and especially by Italian, physicians—a question which recent investigations and discoveries have put completely beyond doubt. Such being the case, much diminution of the mortality from this disease may be obtained by suitable preventive measures—a mortality which places consumption at the head of the list of causes of death. While zymotic affections of all kinds put together kill yearly 45,000 people in England and Wales, no less than 70,000 persons die annually from consumption and other tubercular diseases.

A remarkable and instructive paper on this subject was published in *HYGIENE*, Vol. IV., p. 339, contributed by Dr. Arthur Ransome, Physician to the Manchester Hospital for Consumption, and entitled “On the Need of Special Measures for the Prevention of Consumption.” Dr. Ransome has proposed that phthisis should be classed with other infective disorders, and brought under the provisions of the Diseases Notification Act. A vast amount of useful

and interesting facts bearing upon this point will be found in Mr. Russell’s book.

Amongst other infective diseases concerning which Mr. Russell has collected information with a degree of perseverance and discrimination doing him great credit, are epidemic diarrhoea, dysentery, diphtheria, glanders (several instances of which in human beings have lately occurred in London), influenza, measles, the plague, scarlet fever, small-pox, typhoid and typhus, and whooping cough. We could extend this list, but we hope that we have said enough to induce our readers to refer to the book for themselves.

Under the heading of Notes and Observations, Mr. Russell has given a series of interesting remarks upon numerous matters of hygienic importance, *e.g.*, susceptibility to infective diseases, bacterio-therapeutics, hospitals, house construction, schools, milk, quarantine, the communication of the diseases of animals to man, disinfection, the origin and spread of zymotic affections, sanitary organisation, and the relation of weather and season to health.

The concluding chapter admirably epitomises the contents of the whole book, showing that three main conditions give rise to epidemic disease, *viz.*—1. Floody, marshy, or water-logged soil; 2. Filth and decaying organic matter on the surface of the earth, in houses, in water, and in air, in connection with human agency; 3. Contagion or infection from the sick to the healthy. To the first cause may be traced ague and malarial fever. The second cause, either alone or in combination with the first, is responsible for cholera, typhoid fever, yellow fever, typhus, tuberculosis, the plague, diphtheria, and probably dengue and influenza; also scarlet fever, measles, mumps, small-pox, and chicken-pox; while the third condition causes epidemic cholera, typhus and typhoid, yellow fever, diphtheria, scarlet fever, measles, small-pox, whooping cough, mumps, influenza, dengue, erysipelas, the plague, &c.

The means of prevention of these diseases are

broadly stated by Mr. Russell as follow :—  
 1. Drainage of land and precaution against floods ; 2. Cleanliness and dryness in the house and its surroundings, provision for pure water supply, ventilation, ample space in dwellings, prevention of overcrowding, rapid and cleanly disposal of filth, and similar care for domestic animals, and national provision against distress ; 3. The most careful isolation of the sick, and disinfection, with national and local defences against importation.

## Notes and News.

THE UTILITY OF THE VEGETABLE KINGDOM to mankind might be considerably increased, according to Professor Goodall, of Harvard University, U.S.A. He states that while the existing species of flowering plants upon the surface of the globe number about 110,000, those utilised by man either for food or in the arts do not number even one per cent. of this total. If flowerless plants are taken into consideration, the percentage becomes very much smaller. Here is a wide field of investigation for any scientific observer with a practical turn of mind. Frenchmen seem to have been at work in this direction, for we learn from Paris that a new garniture for salad has lately been introduced there in the chrysanthemum flowers, which are served either raw or cooked. In Japan it is the custom to boil them with a clove, and afterwards serve them cold, with truffles. Chrysanthemum flowers are said to be also agreeable to the taste when boiled and eaten hot.

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A CONFERENCE OF PLUMBERS and others was held at the Borough Road Polytechnic Institute on October 3rd in connection with the opening of the workshops and classes. There was a large attendance of persons interested in promoting the better technical education and registration of plumbers. Sir Philip Magnus, Chairman of the Educational Committee, presided, and stated that the object of this and subsequent conferences was to consider the best methods of bringing education to bear on the several trades, the science and technology of which were to be taught in that Institute, which was the first opened under the Act. It was most appropriate that the first of the series should have to do with the plumbing trade, because that was unquestionably the most important trade in relation to the health of the community. Sir Philip laid special stress on the training of plumbers, who had to combine, in the exercise of their duties, some knowledge of mechanics, physics, metallurgy, and chemistry. As evidencing the growing demand for

registered plumbers, he mentioned that it was becoming customary, in specifying for important sanitary work, to stipulate that only plumbers holding certificates of registration by the Plumbers' Company should be entrusted with its execution.—Mr. Alderman Stuart Knill (Lord Mayor Elect), the present Master of the Plumbers' Company, urged the necessity and value of such educational facilities as were afforded by the technical classes. When, some years back, he had seen the immense danger to the public that resulted from defective plumbing work, and the practical manner in which the Plumbers' Company were endeavouring to obviate that danger by promoting the education and registration of plumbers, he had asked to be allowed to join that company. He was now more than ever convinced of the absolute necessity of these measures in the interest of the public health. He had attended a large number of public meetings on the subject in all parts of the kingdom, and he had been happy to find that everywhere the efforts of the Plumbers' Company were most enthusiastically seconded by plumbers themselves, as well as by the municipal, sanitary, and educational authorities. He was ready to devote himself to the very utmost of his power to still further promoting the great sanitary and educational work which had been so far successfully carried out, and was of such vital importance to the health of the community.—Mr. Edric Bayley, Chairman of the Governors of the Institute, endorsed the remarks which had been made by the previous speakers. We might have the most perfect system and the most perfect laws in connection with sanitation, but, unless the work was efficiently carried out, that system and those laws would be practically useless.—Several others took part in the subsequent discussion, including Professor W. R. Smith, who heartily agreed with what had been said concerning the expediency of the more systematic education and the registration of plumbers, the movement in favour of which was strongly supported by medical officers of health throughout the kingdom. After the proceedings had been concluded with a vote of thanks to the chairman, most of the persons present at the meeting inspected the workshops and class rooms.

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CAMBERWELL.—Out of fifty samples of food and drugs submitted by the inspectors to Mr. Teed, the public analyst, for analysis, twelve were found to be adulterated, being twenty-four per cent. of the total number. These twelve adulterated samples consisted of cocoa, coffee, margarine, milk, and mustard.

\* \* \*

COOKERY CLASSES FOR SAILORS have been started by the Liverpool School of Cookery, acting in co-operation with the Liverpool Shipowners' Association. Everyone who has our sailors' welfare at heart, and who has had an opportunity of seeing how good meat



and other provisions are sometimes spoiled in the cooking on board ship, must wish success to this new movement in the right direction.

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**FEMALE WOMEN!**—Sir Spencer Wells relates that upon one occasion he asked an American examiner his opinion as regards the subject of women entering the different professions. "Well, sir," was the reply, "in our country we have a great many female doctors, female journalists, female preachers, and females in all classes of professions and trades; but what we want is more female women!"

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**HASTINGS WATER SUPPLY.**—The Corporation have instituted experiments at Brede, with the view of increasing the water supply of this favourite resort. It is estimated that the cost of executing the necessary works will be £70,000, and that when the wells have been sunk a daily yield of 3,000,000 gallons of excellent pure spring water will be obtainable.

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**THE POLLUTION OF RIVERS** is a subject of just complaint from many parts of the country, especially from the manufacturing districts of Lancashire and Yorkshire. It was from the latter county that a letter was sent to the Rivers Pollution Commission of 1851, written with water taken from the River Calder, at Wakefield, in such dark characters as to simulate watered ink.

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**THE MANCHESTER SHIP CANAL** forms the subject of frequent articles and paragraphs in the Press, touching construction and finance; but scarcely anyone appears to have given a thought to the danger to public health which must arise from the existence at Manchester of huge docks filled with almost stagnant water largely admixed with foul water from the sewage-polluted Irwell.

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**A STEP IN THE RIGHT DIRECTION.**—The Urban Sanitary Authority at Stockton-on-Tees, in advertising for tenders for the large new Fever Hospital, specified that the plumbers' and sanitary work and the heating of the premises should be let as a separate contract. This is as it should be, bringing the plumbers directly into contact with the principal employers, instead of giving them all the risk and worry of being sub-contractors.

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**A HUMAN OSTRICH.**—The bird of the desert has the reputation of possessing a remarkable avidity for swallowing any substance, however indigestible, that may come in its way, not even refusing tenpenny nails; but a woman who died recently in a lunatic asylum at Melbourne must have gone farther still, for a post-mortem examination revealed the existence in her stomach of three German silver teaspoons, a piece of iron used to connect the handles of a door lock, and two triangular pieces of glass.

**THE CORPORATION OF STOCKTON**, in order to assist in securing good workmanship, have made it a stipulation that all the workmen employed on their works should be paid the full rate of wages.

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**THE METROPOLITAN WATER SUPPLY.**—Professor Frankland's report for September shows that though chemically the water of the Thames at Hampton was of the same quality in that month as in the preceding one of August, yet the water delivered by the five companies drawing from that source was inferior. The returns for last September, as compared with the same month of 1891, show an increase of 10,240 services, and of 8,568,565 gallons of water consumed.

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**A PRAYER FOR LANDLORDS** was included amongst those approved by the Church authorities in the time of King Edward VI. The prayer, as printed in the last primer of Edward VI., published about 1550, is as follows:—"We heartily pray Thee to send Thy Holy Spirit into the hearts of them that possess the grounds, pastures, and dwelling-places of the earth; that they, remembering themselves to be Thy tenants, may not rack and stretch out the rents of their houses and lands; nor yet take unreasonable fines and incomes, after the manner of covetous worldlings; but so let them out to others that the inhabitants thereof may be able to pay the rents, and also honestly to live, to nourish their families, and to relieve the poor." To which laudable prayer, we fervently say, "So mote it be!"

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**FIRES IN LONDON** have, according to the report of the London Salvage Corps, increased by 50 per cent. during the ten years which have elapsed since 1882, the average number annually, calculated on the ten years, being 2,291. It may prevent some ill-natured and, as it would seem, uncalled-for comments, if we add that no less a proportion than 25 per cent. of this enormous number of fires occurred in uninsured premises.

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**THE DWELLINGS OF THE POOR.**—At the last monthly meeting of the Mansion House Council on the Dwellings of the Poor, it was reported by Mr. John Hamer, the honorary secretary, that, during the previous month, between five hundred and six hundred houses had been inspected in various metropolitan districts. The greater portion of the requests for inspection had come from working-men, in answer to the Council's advertisement inviting the co-operation of householders by reporting insanitary conditions to the Council. It is startling to learn that, in nine cases out of every ten, the complaints made were found to be fully justified. If so, what could the local sanitary authorities have been about that people had not got, or imagined they could not get, proper attention and redress in their own districts?

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## SPECIAL NOTICES.

EDITORIAL.—The Editor begs to express his thanks to numerous correspondents, and to state that he will be pleased to receive any communications and articles coming within the scope of *HYGIENE*, health reports, &c.

PUBLISHING.—*Subscriptions* for 1893 are now due. *HYGIENE* will be sent for twelve months, post free, on prepayment of 6s. only, to any address in Great Britain, Ireland, United States, Canada, France, Germany, Austria, Belgium, Netherlands, Italy, Spain, Portugal, Switzerland, Prussia, Denmark, Norway, Sweden, and other countries included in the Postal Union.

The *Title-page* and *Index* for 1892 will be issued with the January number.

## SEWAGE DISPOSAL, WITH REFERENCE TO RIVER POLLUTION AND WATER SUPPLY.

By Professor HENRY ROBINSON, M.I.C.E.

It is of the utmost importance that the sewerage of towns in future should be carried out in the light of the experience that has been gained in the past, and that the sewers should be designed to remove, and not to retain, the foul matters that are delivered into them. It is considered to be impossible to accomplish this if the

sewers are made of a size to carry off the bulk of the rainfall. During long periods of dry weather the sewers retain much of the solid matter, which deposits, decomposes, and evolves unhealthy and filthy smells. The existence of such a state of things in hot climates would be disastrous to health. Relief sewers to meet the conditions that occur during heavy rainfalls should, it is thought, be more relied on than is now the case, so as to enable the sizes of the sewers to be made sufficient for sewage proper, and to avoid their being sewers of deposit, which they too often are. Sewers ought to be self-cleansing, and the sewage which is removed by them ought to be brought to the point of discharge in a fresher state than is possible where the sewers are calculated to convey the bulk of the rainfall with the sewage. They then inevitably become sewers of deposit in dry weather, and give off dangerous gases. The first heavy rains flush the sewers, and carry the highly decomposed matter to the outfalls, increasing the difficulties of dealing with it; and if it is discharged into rivers, a destructive effect on fish life is produced.

The discharge of sewage or manufacturing refuse into streams, to avoid the expense of previously treating it, must be protested against. The rivers must no longer be regarded as the natural vehicle for removing it. What was at first an evil of comparatively small extent has, with the rapid sewerage of towns, become one of



great magnitude. Public opinion is favourable to the adoption of drastic measures. The Rivers Pollution Prevention Act of 1876 requires amendment, so that it shall be mandatory instead of permissive. There is no justification for delay, inasmuch as even in 1872 it was stated (in the Fourth Report of the Second Commission) that "methods have been described in our reports, involving no excessive expenditure, by which the foulest liquid waste from manufactories can be adequately cleansed. We believe that the adoption of none of them will inflict any injury at all upon manufacturers; indeed, we have every reason to conclude that their adoption will save the manufacturers of this country from inflicting considerable injury upon themselves, whilst by preserving the whole course of rivers in a comparatively clean and useful condition, they will tend powerfully to the extension of manufactories upon their banks. One of the most crying evils in manufacturing districts is the want of clean water, and, therefore, every successful effort to make dirty water again usable is a gain to the manufacturers."

Standards of purity should be arrived at so as to enable the conditions which exist at any place to be fairly considered and dealt with. It would be inequitable were expensive works for purifying town or manufacturing refuse to be insisted on where the point of discharge enables it to be quickly carried seaward, or is remote from sources of supply of drinking water. The necessity for such standards is obvious, and is well recognised. Mention should be made in this connection of the intelligent action which has been taken, by which standards of purity for all liquids discharged into the River Spree have for years been in operation, owing to the pollution which arose from the sewage of Zurich being passed into that river.

The discharge of the waste products of human life into rivers used for domestic water supply must be attended by more or less danger, inasmuch as they will probably always contain a proportion of the germs of the various diseases which are

capable of being disseminated and propagated in water.

The action that has been taken by the State Board of Health of Massachusetts to protect the purity of inland waters deserves to be specially commended as an example of broad and wise policy in instituting the systematic investigations by engineers, chemists, and biologists of all that bears upon the purification of sewage, and on the filtration of water. By an Act of that State, examinations are made of all waters for the purpose of ascertaining whether they are adapted for domestic supply, or are in a condition likely to impair the interests of the public, or to imperil public health. The exhaustive reports under these different heads may be fairly stated to be far in advance of anything that has been attempted in this country.

The history and condition of a river into which sewage is discharged requires to be studied from several points of view, as conclusions arrived at in regard to one river may be totally inapplicable to another.

A very remarkable investigation was made at the beginning of last year by Professor Von Pettenkofer with reference to the sewage pollution of the River Isar, between Munich and Threising, when the river was at the lowest level from the long drought of the previous winter, and, consequently, when the proportion of fecal matter to volume was at its maximum. The relative volumes of this river were fifty cubic metres per second during this dry period, as compared with 350 cubic metres per second during a previous flood time. A comparison was made between the amount of oxygen that was required to destroy the organic substances in the water at the time of minimum flow, and the amount that was required in previous periods of flood, and the observations of Professor Von Pettenkofer led him to the singular conclusion that no evil results to public health followed the discharge of raw sewage into the river, and he undertakes to prove that bacteriological investigations do not support the view that injury is

done to this river by sewage being discharged into it.

The chief characteristics of fresh sewage are free ammonia (or decomposition in progress) and chlorine. When sewage is discharged into a river, it becomes diluted, and the ammonia is reduced by oxidation, and through absorption by plant life. If it were not for the natural purification which rivers are capable of, the constant discharge of polluting matter into them would have made the evil cumulative. Fortunately, the innumerable organisms which exist in rivers, and which thrive on organic matter, act as scavengers. They are aided by minute plants, which, under the influence of light, liberate oxygen and help to oxygenate the water.

It has been ascertained that entomostraca consume dead animal matter, and that where this is wanting they do not live, but where it is in abundance they thrive. It follows, then, that these minute animals exercise an important function in absorbing sewage impurities, and are both increased by them and fed upon them, converting foul and dangerous matters into harmless ones, in a similar way to that which is referred to further on as nitrification, when speaking of the action of bacteria in the soil.

In a sluggish river, pollution is less capable of being naturally removed than in rivers with falls, rapids, and swift currents. Some observers attribute the self-purifying properties of rivers more to the natural action of deposition, bacteria, and plant life than to any chemical influence of oxygen.

To new countries, whose rivers are free from pollution, but where new centres of population are springing up, a warning should be given to avoid the evil results that older countries are now suffering from.

Efforts are being made to divert sewage from the River Seine, and nine main sewers which used to discharge into the Seine, at the Island of St. Louis, have been diverted by a syphon under the river, and this grave cause of pollution has been removed.

The River Thames will soon be no longer the recipient of the crude sewage of London, which has for so many years been a subject of strife. It is now admitted (after long and costly inquiries) that the outfalls at Barking and Crossness must be adapted to the clarification of the sewage, and the London County Council, under the advice of their able chief engineer, Mr. Alexander B. Binnie, C.E., and the intelligent supervision of his colleague, Mr. Santo Crimp, C.E., are adapting the Crossness Outfall Works to chemical treatment, as was done at the Barking Outfall by the late Sir Joseph Bazalgette, the chief engineer of the Metropolitan Board of Works (the predecessor of the London County Council).

A clause was inserted in the Local Government Act, 1888, enabling county councils to deal with river pollution, from which powers some good will result. An effort has been made by the authorities of Chester, Lancaster, Derby, and others interested in the River Irwell (notorious for its foul condition), by which the Rivers Pollution Prevention Act of 1876 could be put into force by the granting of a Provisional Order conferring powers on them. An application was made at the end of 1890 for such powers, and this forms an important precedent which will probably be followed up throughout the country. Objections were raised to such joint action on the ground of interference with the existing powers of the several local authorities who have ostensible control, and that such concurrent jurisdiction would create difficulties. Where land is obtainable in sufficient areas, and of a porous nature, the fertilising properties of sewage can best be utilised on it, both from an agricultural and a sanitary standpoint. This is seldom possible, and where attempts have been made to purify sewage on unsuitable soils, commercial and sanitary failure have resulted. Experience has proved that where clayey or impervious lands have been deeply drained so as to insure the passage of sewage, the result has been that the sewage has passed into the subsoil drains



only partially clarified. In a recent case, the deep drains have had to be done away with, and the land used for broad irrigation. Twenty years ago the application of sewage to land was advocated under all circumstances, but experience has shown that the result of applying more than a very limited amount of sewage to non-porous soils is that it is not purified, and that sanitary mischief arises. The sewage may, to some extent, be mechanically strained, but the absence of the necessary free oxygen in the pervious soil prevents purification. When sewage irrigation or filtration is carried on without care, and without the knowledge of the chemical and biological laws which require to be considered, there is a risk of pollution to subsoil waters and streams into which the sewage effluent passes. If an area of porous land can be obtained sufficiently large to enable the sewage of about 100 persons to the acre to be applied intermittently, then good agricultural results will ensue. Where sandy soils exist, as at the Craigentenny Meadows, near Edinburgh, or at Genuévilliers, where part of the sewage of Paris is treated, then large volumes can be applied with advantage to vegetation, and enormous crops can be produced. These are adduced as conclusive proofs that sewage ought to be applied to land. Hungry soils, of the nature referred to, will no doubt pass immense volumes through them, and the crops will retain and assimilate that which they require, to the great advantage of the agriculturist. If, however, the subsoil waters were examined, insanitary conditions would be disclosed which should point to the necessity of taking a broader view of the subject than has too often been the case when irrigation enthusiasts have had their own way.

Mr. Robert Warington, in his experiments at Rothamsted, long ago established the fact that micro-organisms perform an important function in sewage filtration, and that the action of an earth-filter is not mechanical, but partly chemical and partly biological. The destruction of the organic impurities in sewage was shown to be

brought about by a process of active fermentation or decomposition (termed nitrification) caused by bacteria. A question of great practical importance in connection with both sewage disposal and water supply is whether any of these organisms can escape destruction. The conclusion that was arrived at by the American investigators in the before-mentioned report of the State Board of Health, Massachusetts, was that the belief that bacteria cannot survive, to pass through sand-filters, is fallacious, although the great bulk are destroyed. It follows, from what has been said, that in the disposal of sewage upon land, or in filtering impure water, the necessity arises for exercising great care. Experiments upon sewage filtration have been made by Mr. Hiram Mills, C.E., of the Lawrence Experimental Station, in America, which confirm the view that nitrification ceases if the filtration is not conducted intermittently. Also that sewage effluents that have been passed through sand-filters covered with soil, in which nitrification took place, resulted in the destruction of bacteria, and that the effluents from such filters were not favourable to the support of bacteria. This is due to the fact that the free and albuminoid ammonia in such effluents, being the residue of a much larger amount than has been destroyed, are much less able to support bacterial life than fresh organic substances containing the same amount of free and albuminoid ammonia.

Dr. Sedgwick, of the Lawrence Station, experimented specially to ascertain whether bacterial organisms could live to pass through five feet of coarse sand-filters, worked intermittently. He found that they could, especially the bacillus prodigiosus, which appears to be a hardy specimen. It may be taken as proved that, although the large bulk of organisms are destroyed by efficient filtration, nevertheless some do pass when the filters are composed of sand alone. When the filters were of fine sand, but were covered with earth, the bacteria appeared to be all nitrified, and the effluent, even from sewage, was harmless, and might be drunk. The practical

question is: Are sources of water supply that require filtration to be condemned? The answer appears to be that, where possible, such sources of supply should be avoided, as circumstances might arise to cause some disease, producing bacteria, to exist in the water, and as they are capable of increasing with enormous rapidity under favourable conditions, it would be unwise to disregard the possible mischief that might follow. With filters, however, properly constructed and manipulated the mischief is avoidable. The data which are now available clearly indicate to engineers that the efficacy of the ordinary sand-filter can be increased greatly by covering it with earth suitable to the development of the nitrifying action in the filter.

Chemical precipitation of sewage is now very frequently resorted to for the purpose of destroying the noxious properties in sewage. The hopes, however, of the first workers in this field of invention of doing this profitably have long since disappeared. The sanitary and commercial aspects of the matter have to be kept in view, and the experience that has been accumulated enables simple chemicals alone to be adopted. These are able to effect sewage purification by themselves, where the highest standard of effluent is not required, or where they can be supplemented by passing the effluent through filters. Crude sulphate of alumina, proto-sulphate of iron (commonly called copperas), the waste product of tin works, are chemicals easily obtainable, and are most usually employed to produce precipitation. A small amount of lime is used as an alkali, care being taken not to have an excess of lime if the effluent is to discharge into a stream where the secondary decomposition resulting from a lime effluent would be objectionable. If a high standard is necessary, it is usual to pass the effluent through a small area of filter specially prepared, so that it effects the changes referred to elsewhere when speaking of nitrification. An artificially-prepared material, called polarite, has attracted much attention recently. This is an insoluble, porous, and

magnetic material, used by the International Sewage and Water Purification Company, which has the property of destroying organic impurities in fluids in a remarkable manner. Dr. Anderson, C.E., has introduced the use of scrap-iron in a revolving cylinder as a medium through which impure water can be passed and purified.

The sludge deposited from any process of chemical treatment has a very doubtful value for agricultural purposes. That known as the ABC process (where alum, blood, and clay are the precipitants) claims to have a higher value than chemists assign to it, and, as recent researches show how much has yet to be learned about the changes that take place in the soil, the simple test of agricultural results appears a fair one if applied commercially.

At the Metropolitan Outfall Works at Barking the sewage is treated by the addition of milk of lime in the outfall sewer, then proto-sulphate of iron is added, and in the summer months permanganate of potash in addition to both.

Where the sludge does not command a sale for manurial purposes, it has to be got rid of in the most economical way, so as to avoid creating a nuisance. This is sometimes done by partially drying it in mechanical presses, and so converting it into a partially solid material (having about fifty per cent. of moisture in it), so that it can be carted away, and sold or used to fill up low-lying land. At Barking it is taken in steamers specially constructed for that purpose, and conveyed away to the sea, where it is got rid of.

SERVANTS' SLEEPING ACCOMMODATION in many houses at the West-end of London is most disgracefully inadequate, and in direct opposition to the most elementary principles of sanitation, as we have more than once pointed out in HYGIENE. Our statements are fully confirmed by the last report of the medical officer of health for Marylebone. Writing on this subject, he says: "The servants are frequently put to sleep in dark, unhealthy, damp basements, which, under the Public Health [London] Act are technically called "cellars," and such cellars are mostly of illegal construction; therefore, it is an offence to compel servants to sleep in such places."



## WINTER AND SPRING IN THE CANARY ISLANDS.

By FRANCIS PARSONS, M.D.

(Concluded from page 338.)

CONTINUING our journey across the Island of Teneriffe, we leave the fertile plain and picturesquely wooded district of Laguna, driving along the well-constructed road through Tacoronte and several other villages, whence we look down upon the north side of the island and upon the Atlantic.

The most memorable feature about "Metanza" is, that it is the usual place to lunch. Having fulfilled this function, we continue our descent through plantations of bananas (of which there are said to be fifteen varieties cultivated in Teneriffe), the scenery becoming richer and more varied as we approach the sea. Gay creepers twine about the rocky cuttings; bougainvillias and begonias mingle their sprays of purple and pink with the bright blue of the plumbago *capensis*; tall daturas scent the air, and wild roses and geranium bushes, four feet high, grow along the roadside.

A few Spanish "casas de campo" are scattered about with hedges of the peculiar-looking, fleshy-leaved prickly pear (*Opuntia tomentosa*) on which the cochineal insect is reared. This once remunerative industry has been destroyed by the introduction of aniline dyes. Fig-trees are numerous; the characteristic *Euphorbia Canariensis* and date palm grow in most gardens. Eucalyptus trees have been planted along the roadside, together with grevillias and Oriental planes. The rocks are carpeted with *Selaginella denticulata* and *Echium giganteum*. As we approach Orotava the botany has quite a different character to that of the south side of the island, where the vegetation has more of an African aspect.

Descending into the valley we see the Port of Orotava stretched out upon a peninsula of volcanic rocks surrounded by the bluest of seas;

the waves of which come dashing in against the rugged lava, breaking in clouds of silvery foam; and above a magnificent pile of towering hills rises the wonderful Peak of Teneriffe (over 12,000 feet), and now (in February) capped with snow. The dresses of the peasantry indicate the change of climate, the women wearing coloured handkerchiefs over their heads in such a manner as to protect the neck and back from the heat of the sun. The favourite costume of the men is the "manta," or blanket cloak; whilst the children, attired in single garments of cotton, run after the carriage and beg for "cuartitos."

So much has been written in praise of the scenery in the beautiful valley of Orotava; of its waving fields of sugar-cane; its stately palms, its glens, ravines, caverns, tropical trees, ferns, fruits and flowers, that one is apt to feel some little disappointment at the comparative rareness of large trees; to eyes accustomed to the shady groves of Madeira, or even to the rich forest scenery round about Laguna, the landscape strikes one as somewhat bare. The Canary palm is a splendid specimen of its tribe, but they are few. The euphorbias, cacti, and even the world-famed dragon tree, are more curious than beautiful; but any deficiency in this respect is fully compensated by the azure sky, the glorious colouring of the clouds, and above all by the majestic grandeur of the sea.

The late Dr. Victor Perez, I believe, first called attention to the great advantage Orotava possesses in having a marine and mountain climate accessible to invalids, and Dr. George Perez has pointed out how two high ridges descend from the Cordillera, ten miles apart, and shelter Puerto Orotava from disturbing winds. Mr. Ernest Hart indicated the advantages of the cloud canopy which often hangs over Orotava as a parasol, protecting invalids from the effect of the mid-day sun. But I am not aware that anyone has given sufficient prominence to the invigorating influence of the sea (in which bathing may be indulged in even at

Christmas), and the therapeutic importance of the exceptional amount of ozone generated on this bold rocky coast.

I am indebted to Mr. Perry, of the "Citio de Cullen," for valuable meteorological information respecting Orotava, the result of regular and careful observations, extending over a considerable period. The mean temperature for the winter months averages 63·8° Fahr. The means for the different months throughout the year are shown in the following table :—

|                 | Degrees. |                  | Degrees. |
|-----------------|----------|------------------|----------|
| January ... ..  | 63·9     | July ... ..      | 71·6     |
| February ... .. | 59·2     | August ... ..    | 73·7     |
| March ... ..    | 65·7     | September ... .. | 75·4     |
| April ... ..    | 65·2     | October ... ..   | 72·2     |
| May ... ..      | 67·3     | November ... ..  | 66·7     |
| June ... ..     | 72·7     | December ... ..  | 65·5     |

For comparison we may give the mean annual temperature at the following places (quoted from Belcastle's work, "Les Iles Canaries") :—

|               | Degrees. |                  | Degrees. |
|---------------|----------|------------------|----------|
| London ... .. | 50·3     | Nice ... ..      | 59·3     |
| Pau ... ..    | 55·9     | Madeira ... ..   | 66·0     |
| Rome ... ..   | 60·1     | Teneriffe ... .. | 68·5     |

The difference in temperature between the coldest and hottest months at Puerto Orotava is only 14·2° Fahr. The extreme range in one day after six months' observation amounted only to 5·4° Fahr. The average night temperature in winter is 52°. The mean annual rainfall is estimated at 13·4 inches, rain falling about once a week.

Hours of clear sunshine at Orotava :—

|                 |     |                  |     |
|-----------------|-----|------------------|-----|
| January ... ..  | 164 | July ... ..      | 183 |
| February ... .. | 163 | August ... ..    | 182 |
| March ... ..    | 176 | September ... .. | 158 |
| April ... ..    | 149 | October ... ..   | 162 |
| May ... ..      | 203 | November ... ..  | 142 |
| June ... ..     | 196 | December ... ..  | 152 |

From a hygienic point of view I would summarise the advantages of Teneriffe as a winter resort for invalids, as follows :—

1. The extreme equability of the climate.
2. The large amount of sunshine as compared with European health resorts.

3. The small amount of rain.

4. The porous nature of the soil.

5. The abundance and purity of the water supply.

6. The absence of chill at sunset, when the trades-wind is replaced by the warm south land-wind, and the comparative freedom from tempest.

7. The invigorating influence of the Atlantic breezes, the large percentage of ozone in the air, and the absence of malarial emanations.

I may perhaps add, for the satisfaction of invalids, that the medical profession is well represented in Teneriffe, and there is an absence of that tyranny of treatment so distasteful to the independent Briton when making his continental "cures."

Between Puerto Orotava and the villa or town, some 1,000 feet higher, is the celebrated Botanic Garden, founded by Charles IV., under the auspices of the Marquis of Nava, in 1790. At the present time, under the direction of the curator, Herr Wildpret, it contains upwards of 3,000 varieties of plants belonging to tropical, sub-tropical, and temperate zones. Here may be seen the Royal palm of the Brazil, the fan palm, date palm, and Canary palm in all their magnificence.

Dr. G. Perez has a beautiful farm situated on the slope of a hill just out of Orotava ; here also are some fine specimens of semi-tropical trees and plants. The views of land and sea are magnificent.

Some of the rarest and most beautiful specimens of tropical trees and plants are to be seen in the garden of Mrs. Charles Smith, the widow of a physician who sought health at Orotava and lived to an advanced age. Here we saw loquats and guavas growing in abundance, and tasted some delicious patangas. The view from the verandah is particularly fine upon a clear day. The Island of Palma is visible, though distant about a hundred miles.

Icod, a town some eighteen or twenty miles west of Orotava, is in a very beautiful district,



and commands one of the finest views of the Peak. Invalids sometimes find a change to Icod beneficial. Doubtless as the advantages of the Teneriffe climate obtains a wider recognition, suitable hotel accommodation will be provided for invalids, not only at Icod, but also at Villa Flor, upon the Peak, said to possess one of the most aseptic atmospheres in the world.

Teneriffe is still undeveloped as a health resort, although the hotel accommodation at Orotava is now very good. Nature has done so much, the Spaniards seem to think, that nothing more is required. Sanitation is sometimes of a very primitive character. The postal service is supremely Spanish in its entire disregard of punctuality or dispatch. Though bathing in the open sea, with the water warmed by the Gulf-stream to a temperature of 66° in winter, is itself a luxury, it would be more generally appreciated if some sort of accommodation for bathers were provided.

The climate of Teneriffe is contra-indicated in tuberculosis of the intestines; and spasmodic asthma is said to be aggravated by the stimulating atmosphere, probably from the large percentage of ozone generated by the surf. The cases of sickness which are said to derive most benefit from the climate are pulmonary consumption, chronic bronchitis, diseases of the kidney, diabetes, besides anemia and other post-malarial conditions. A number of convalescents after influenza went out with me, and all appeared to derive benefit in a very short time.

The whole island is a rich and varied store-house for the student of natural history, and presents a wide, and as yet unworked, field of interest for the artist.

Leaving Santa Cruz, we sail south-west, along the rugged rock-bound coast of Teneriffe, above which the Peak stands out in all its grandeur, clear and well-defined against the sky. The distance from Santa Cruz to Las Palmas (the chief town and port of Grand Canary) is only about eighty miles. Passing San Luz we land at the Mole, some four miles from the town, and

drive along a sandy road which looks as if it might have been sliced off the Sahara. The town, with its low walls, flat roofs, straight streets, and queer cubical houses, mostly white, yellow, or pink, with green shutters, has an intensely Moorish aspect, and the peasant-women wearing white cashmere over their heads, as a protection against the sun, have a very Oriental appearance.

There are several handsome churches beside the cathedral; opposite to which is a museum containing some Guanche remains. There are two or three good English hotels in the town of Las Palmas, and several Spanish "Fondas." Water would appear to be too valuable a commodity to admit of its being used for washing the persons of the poor. Many of the houses are extremely dirty, and typhoid is said to be something more than an abstract idea. The carriage drives are less numerous than in Teneriffe; but many interesting mountain passes may be explored on the back of mule or pony. The soil is so rich that it will produce four crops in the year; the vegetation has quite a tropical character, and the Canary oranges are amongst the finest in the world.

The general aspect of the flora resembles that of Teneriffe, but is of a more tropical type. The *Ricinus communis* and other varieties are very abundant in the gardens, with lofty palms, almonds, chestnuts, and pines. There are some interesting cave-dwellings, and the Caldera, or bed of an extinct volcano, 500 feet deep, is well worth a visit. It is situated near Telde, a few miles from Las Palmas.

Sugar-making appears to be a growing industry; cinnamon, cloves, and camphor thrive; whilst the vine is extensively cultivated and excellent wine produced; some tobacco is also grown upon the island.

Owing to the dryness of the climate, the dust and sand floating in the air along the road between Las Palmas and the Mole are rather a disagreeable feature. The bathing is excellent, and may be indulged in all the year round,

I am indebted to Dr. Brian Melland, the deservedly popular English physician at the Santa Catalina Hotel, and to Dr. Cleasby Taylor, of Las Palmas, for the following observations on the climate of Grand Canary :—

Las Palmas is about 10 degrees warmer than Mentone, with far greater equability.

Invalids in the first stage of pulmonary consumption do well and often make good recoveries ; more advanced cases sometimes

| 1890-91.   | Shade Temperatures. |              |       |        | Bright Sunshine,<br>Hours (per diem). | Rain.<br>(Inches.) | Humi-<br>dity<br>(100=<br>Satn.) | No. of<br>days any<br>Rain<br>fell. |
|------------|---------------------|--------------|-------|--------|---------------------------------------|--------------------|----------------------------------|-------------------------------------|
|            | Mean<br>Max.        | Mean<br>Min. | Mean. | Range. |                                       |                    |                                  |                                     |
| October -  | 73·4                | 65·8         | 69·6  | 7·6    | 5 hrs. 30 min.                        | 3·23 in.           | Per Cent.<br>73                  | 7                                   |
| November   | 70                  | 61           | 65·5  | 9      | 5 „ 15 „                              | 2·40 „             | 72                               | 10                                  |
| December - | 67                  | 56           | 61·5  | 11     | 5 „ 2 „                               | 2·33 „             | 70                               | 15                                  |
| January -  | 64                  | 54·5         | 59·2  | 9·5    | 4 „ 45 „                              | ·53 „              | 68                               | 10                                  |
| February - | 65                  | 53           | 59    | 12     | 6 „ 22 „                              | ·78 „              | 69                               | 4                                   |
| March - -  | 68                  | 57           | 62·5  | 11     | 6 „ 46 „                              | ·19 „              | 68                               | 3                                   |
| April - -  | 69·6                | 59·3         | 64·5  | 10·3   | 7 „ 24 „                              | ·18 „              | 69                               | 4                                   |
| May - -    | 69                  | 59·7         | 64·6  | 9·3    | 6 „ 36 „                              | ·10 „              | 68                               | 4                                   |

The following table gives the mean temperatures during the winter 1889-90, and the sunshine, rain, and humidity for the two winters 1888-90 (*Dr. Cleasby Taylor*) :—

| Date.      | Shade Temperatures—1889-90. |      |       |        | Bright Sunshine<br>(Hours), 1888-90. | Rain<br>(Inches),<br>1888-90. | Humi-<br>dity,<br>1888-90. |
|------------|-----------------------------|------|-------|--------|--------------------------------------|-------------------------------|----------------------------|
|            | Max.                        | Min. | Mean. | Range. |                                      |                               |                            |
| November   | 71·5                        | 63·3 | 67·4  | 8·2    | 5 hrs. 50 min.                       | 1·28                          | Per Cent.<br>67            |
| December - | 66·8                        | 58·6 | 62·7  | 8·2    | 4 „ 18 „                             | 2·05                          | 67                         |
| January -  | 67                          | 57·5 | 62·2  | 9·5    | 5 „ 18 „                             | 1·2                           | 67                         |
| February - | 66·9                        | 57·8 | 62·7  | 9·1    | 5 „ 30 „                             | ·70                           | 65                         |
| March - -  | 64·7                        | 55·6 | 60·2  | 9·1    | 5 „ 15 „                             | 1·56                          | 68                         |
| April - -  | 67·8                        | 60·1 | 64    | 7·7    | 5 „ 25 „                             | ·18                           | 66                         |
| May - -    | 69·4                        | 63   | 66·2  | 6·4    | 6 „ 50 „                             | ·67                           | 66                         |

The characteristic features of the climate would appear to be a dry stimulating atmosphere, with abundance of sunshine. An average mean temperature of 63° in winter, with little variation ; an annual rainfall of less than 10 inches, and from 5½ to 6 hours, sunshine every day. Whilst the winter temperature at Mentone is from 8 to 10 degrees warmer than Torquay,

derive benefit from the warm, dry climate and pure air. Chronic bronchitis, rheumatic affections, and kidney diseases do well. Diabetics derive benefit, as they can spend most of their time out of doors in winter. Physicians are cautioned not to send cases of intestinal tuberculosis or patients predisposed to hæmorrhage ; the climate is too stimulating for spasmodic



asthma ; and laryngeal cases do better at Orotava or at Madeira.

The Santa Catalina Hotel is delightfully situated about a mile from Las Palmas, on the road to the Isletta and landing-place. It has a southern aspect, immediately facing the sea ; the grounds are prettily laid out with palms, acacias, orange, myrtle, and mulberry trees ; there are plenty of roses, arum lilies, and geraniums in full bloom in February. The hotel, built in Moorish style, has upper and lower verandahs commanding magnificent views.

The system of drainage appears to be quite up to our English standard of efficiency ; the management is highly satisfactory, and there is special accommodation for invalids.

In describing the relative merits of rival health resorts it is difficult to acquire that complete impartiality which is essential in the pursuit of truth ; the earthly paradise where the climate is perfect, sanitation above suspicion, and where no discomforts exist is as far from discovery as the lost Atlantis. But those who are obliged to forego the comforts of an English home in winter, to seek sunshine and health in other lands, will not, I think, regret their choice if, when they sail for summer seas, they cast anchor at those "fortunate islands," "where the sharpness of the winter is not felt, where the air is always pure, and where the golden apples grow in the gardens of the Hesperides."

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AN EXAMINATION OF CANDIDATES for certificates as "Registered Plumbers" was held recently at the new Borough Road Polytechnic Institute, in the new workshops fitted up under the direction of Mr. Isaac R. Jones (operative plumber), and the examiners specially commended the various arrangements made. In addition to undergoing a practical test, each candidate was required to answer a set of questions specially framed with the object of ascertaining the applicant's knowledge of the various materials used in plumbers' work, and the general sanitary arrangements of dwelling-houses. Of the twenty-four candidates who presented themselves for examination, only three succeeded in satisfying the examiners of the qualifications as practical plumbers.

## THE PHYSICAL AND INTELLECTUAL DISQUALIFICATIONS OF WOMEN FOR HARD WORK.

By DR. ALFRED J. H. CRESPI, Wimborne, formerly Editor of the *Sanitary Review*.

(Concluded from page 335.)

IF women are to be the companions and equals of man, and his rivals for employment, they must be treated like men, with courtesy and consideration, but still as equals, and they must not look for special favour. Many women admit their inferiority, physical and intellectual, to men ; and pride themselves on the deference paid to them, but that deference will be less marked as the competition between the sexes increases. For social customs there are always good reasons ; and for the subjection of women, if people like to give it that harsh name, valid reasons can be found, and, to some degree, it is unavoidable that by the stronger sex they should be treated as inferiors. Acts of Parliament cannot change social customs, nor can the determined will and well-regulated minds of a handful of resolute women do much to put the rank and file of their sex on an equality with men. As long as the world lasts, women will be physically weaker and less determined than men, and so must fare worse in the stern battle of life. Nevertheless, I cannot accept the present state of things as altogether satisfactory, and assuming that the female is, in some respects, inferior to the male sex, why should not the former assert its legitimate rights, and take its proper place in society ? Woman is not in her proper place when treated as the slave of man ; nor when played with and caressed as a doll. Under the most favourable circumstances, a very small interval should separate her from man, and she should always claim to be, as she is now sometimes, his trusted friend and beloved companion.

In consequence of social customs, and the greater consideration paid to women, ladies of

education and birth find it difficult to get congenial occupation before marriage, and to face the stern realities of active life. A duke's son enters the army as a matter of course, and is not degraded; but a village surgeon's daughters, or a poor vicar's grown-up girls, can do little to earn money, and only one or two callings seem open to them not entailing some sacrifice of position. Whether from peculiarities of physical constitution, or, as many allege, from the education she receives—though of late the methods have become much the same for both sexes—a woman, especially in early life, is less accurate and earnest in the discharge of her duties than a man; she seems especially to need the severe discipline and unpleasant competition of regular responsible employment to fit her for managing a household and training up children. There are few women, I care not whether daughters of tradesmen or gentlemen—for human nature is much the same in all classes—who would not be better in later life were they, from sixteen to five-and-twenty, engaged in useful, responsible work. But in what work? There's the rub. I have taken the trouble to make exhaustive inquiries, and I have tried to find out any remedy which would not be worse than the disease, but to no purpose. An able man, an inspector of schools, assures me that, contrary to the general impression, the female teachers whom he has examined in the course of his duties are as accurate as the male teachers, and, though coming from the same social class, express themselves far better, but he finds them, when they have had equal advantages and the same training, conspicuously inferior in science and mathematics; he adds that women can very rarely teach arithmetic, while nearly all men can. My own experience—not a small one, as an ambulance lecturer and examiner—has been less favourable, and, while I have found the handwriting and spelling of female pupils and candidates far superior to those of men, I have been struck by their wearisome prolixity, and their frequent hopeless, crass ignorance of the

subject, though they have generally had more leisure, fuller instruction, and greater care. A man answers in three lines a question accurately and fully, while a woman writes as many pages wide of the mark, sometimes not even touching the question at all, and conveying to the mind the impression that she had not grasped the principle involved, though none the less is she ready to fill a ream with words *about* it, but not *upon* it. Highly-educated men—*i.e.*, staff and engineer officers, university honours men, barristers, and cathedral dignitaries—however, leave the most highly-trained women hopelessly behind.

Marriage, according to present appearances, will have to be increasingly less and less the aim of women; and it will have to be admitted that it cannot be the consummation of every woman's life. Premature marriage, the enervating life led by the majority of well-to-do girls in the wasted years during which they are on the lookout for a good match, and the consciousness of unfitness to regulate a household are sources of more misery to husbands and wives than has ever been calculated. Nevertheless, women who fail to get married are still very commonly regarded as social failures, and their tempers and spirits often suffer severely. Were only a few of my readers to use their opportunities to provide regular employment for educated women, they would do something towards promoting the welfare of the many unmarried ladies who must be dependent on their own exertions.

Let us now examine the employments which are generally considered suitable for educated women, and the contemplation of them hardly quiets our uneasiness. Those girls of the wealthier classes not entirely left to their own devices after leaving school, and who are not able or disposed to devote themselves to husband-hunting, have very few careers open. They can enter shops, receiving small salaries, and usually living away from home; but nothing except hard necessity will force a girl of refinement and education into a shop; she will



scarcely serve in her own father's shop without fancying herself degraded. So that this large field is practically closed by custom to officers' daughters and other ladies in that class of life. Girls can become dressmakers; but, in addition to the earnings being small, the work of a humble description, and the hours long, social consideration is sacrificed, so that few girls of the middle classes take, or, in the present condition of things, can be expected to take, to it. Situations as companions, housekeepers, lady helps, trained nurses, and hospital matrons are, in proportion to the hosts of applicants, comparatively seldom to be found, and are not suitable for very young ladies. We are driven to the conclusion that the one occupation for middle-class girls, and it is already overstocked to a painful degree, is teaching: thousands find employment as governesses, teachers, and music mistresses; but generally they have to leave home, while, from the small average remuneration, it can scarcely be said that in these ways a sure, sufficient, and permanent income is obtained. It is no use complaining; the wiser course is to throw open other occupations for the comparatively limited number of educated girls who, at any given time, will require them, but I must confess that I cannot see how any large addition can be made to those occupations, especially in view of the fierce competition of men for them.

Remuneration is regulated by economic laws, which neither Acts of Parliament nor social reforms can alter. Dr. Johnson, in spite of his keenness, was at a loss to explain how it was that women were paid less for the same kind of work than men; but was that ever the case? Purchasers are not insane—they ask no questions. When they want something, and can afford to get it, they buy it, concerning themselves not at all with the sex of the maker. True, women, from their very numbers and from so often being provided with comfortable homes by their parents, are often able and eager to do work at home at lower rates than men. But, in such cases, and they are not few, the men are finally

beaten out of the field by the greater cheapness of female labour. The reports lately issued by the factory inspectors show that, when the same kind of work is equally well done by men and women, the regulation price is precisely the same; though none the less true is it that the abler and better men drift off into more highly-paid and difficult occupations, leaving the field to be monopolised by women. Generally speaking, when disparity obtains, the work is not identical. Women are certainly often paid at rates which would be low for men doing the same kind of work, but the explanation lies in the severe competition among women for employment, and the men do not long continue to do that work. Take an ordinary nursery governess. Any kind of male nursery tutor, were there such a thing, would get £40 or £60 a year, perhaps more, while a female governess gets as little as £12, and is glad of £20 or £30, and is delighted to receive £40, but there are absolutely no male nursery governesses—ladies monopolising the charge of young boys. I am speaking of averages, for, as a fact, many governesses are unpaid, while some get £60 and others over £100. The competitors are too numerous for employment to be abundant, and wages must go down accordingly, and no means of artificially raising them is practicable, nor of general application; nevertheless, when a highly-educated woman, the recognised equal of a male university graduate, offers herself, her salary is much the same as his.

Women are admittedly capable of useful work as telegraph or post-office clerks, collectors of money, and in other similar ways; why not find employment in banks, high-class commercial offices, and Government departments on a larger scale than at present for educated women of superior intelligence and good birth? A comparatively small number of such situations would, for a long time, suffice, as the majority of female *employées* ultimately marry. Middle-class women would be better qualified for the wear and tear of life, and better mistresses and

mothers, had more of them some acquaintance with business habits ; and as early marriage would cease to be such a pressing object, many imprudent unions would never take place, or time would be allowed for preparation for a step so disastrous, when rashly entered upon, as marriage. In the last place, it is hardly necessary to add that the remuneration which women employed as clerks would receive would, were they living at home, assist their parents ; or, were they dependent on their own exertions for a maintenance, would, with economy, support them. Every respectable employment thrown open to women helps to relieve the distress and misery among those who have to earn a livelihood in one of the few and ill-remunerated ways now alone possible.

It will be perceived that I advocate some occupation bringing in a fixed income, and allowing those engaged in it to live at home. The worst of most employments reserved for women is that they necessitate removal from home. Again, the importance of the salary being fixed can hardly be over-estimated. The majority of those young ladies, who will for many years depend on their exertions for a livelihood, will not have a fortune, and will be unable to enter upon the uncertainty and keen competition of the professions, where, for the first ten or fifteen years, expenditure outruns income, and a competence can never be counted upon.

My suggestions will not receive the support of many persons who fancy that literature, the public schools, and the learned professions are excellent openings for large number of young ladies. But, as Mrs. Micawber sagely remarked, the conclusion she had come to was that Mr. Micawber required a certainty ; his sole source of revenue—a coal agency producing two shillings and ninepence a fortnight—could not be called remunerative ; and, besides, even that small income was precarious. Just so ; most young ladies who are eager to enter the professions would starve, while a few more favoured

rivals were forcing their way to fame and comparative wealth ; moreover, physic and the bar are already so painfully over-stocked that every successful lady competitor must displace one man at least. The professions are particularly uncertain, and many a professional man of commanding ability earns, after spending lavishly for many years, a beggarly pittance during the earlier part of his career. Let young ladies who want position and occupation take to professions ; but those who expect to live on their earnings must shun employments more often starvings than livings. What reason is there to believe, for example, that after the first limited demand for lady doctors and lawyers was satisfied, those later in the field would fare better than their male rivals ? Literature again is peculiarly precarious. As far as any profession could be open to women, it is open ; no restrictions keep them out. And the immense earnings of George Eliot in her latter days show that the publishers pay for eminence, whatever the sex of the writer. Those persons who, with the best intentions in the world, suggest literature as just *the thing* for young ladies, cannot know what they are talking about. To be a successful author requires extraordinary ability, untiring perseverance, rare knowledge of men and manners, and a command of language which very few women or men possess. Besides, the value of a book or magazine article depends greatly on the social position and eminence of the writer ; this is well known to those behind the scenes. Of two articles of equal merit on the same subject, the one by a writer of national reputation might be well paid for, while the other would be “gratefully declined” by editors and publishers. Worse than this, however, is the comparatively little literary work, unless of conspicuous merit, ever paid for. How many ladies who could write one or two good average papers a week—and most people, try as they will, never can write anything worth reading—would receive remuneration ? Some magazines of decent standing,



especially those appealing to special classes of readers, do not pay at all, or, when they pay, only remunerate distinguished contributors. It would be simply preposterous for many thousands of young ladies to take to periodical literature with any expectation of making it a source of regular and sufficient income; not one in a hundred could earn a guinea a week, not one in twenty could get her articles printed.

Supposing that many women were to enter occupations from which a modest income could be obtained, might not serious evils result? I cannot see any; at any rate, the advantages would counterbalance the evils, whatever they were, twenty times over. Many young men, who now rashly launch into the sea of matrimony, would wait, were their *fiancées* able to support themselves for a few years. But the young lady cannot wait, and the irrevocable step is taken. How much misery results from imprudent marriages? How many careers are, in consequence, irretrievably blighted?

A good deal of nonsense is talked about love in a cottage, and that sort of thing; but few young ladies who have been disposed of by needy parents like a small income, when it falls to their lot, and what unjust reproaches are heaped on the husband, painfully toiling his way to competence; how little sympathy he receives from her who has taken him for better and for worse, but who generally forgets that poverty is as trying to him as to her! It is strange, too, how crude are the notions of young girls—though it may be accounted for by their arithmetical deficiencies—as to the amount of spending in a small income. Well-to-do girls actually talk of living on £70 a year, and doing well on £200. No! better for themselves, better for men, that women should have respectable, well-remunerated occupations open to them in sufficient numbers, so that there would be less need of, less excuse for imprudent unions, and better opportunities for acquiring that discipline and experience which a wife sorely needs.

## PATENT MEDICINES.\*—No. 16.

PATENT MEDICINES AND PIOUS LANGUAGE;  
THE REVEREND SPECIALIST; CONGREVE'S  
BALSAMIC ELIXIR; OWBRIDGE'S LUNG  
TONIC; LANE'S CATARRH CURE; A QUACK'S  
CERTIFICATE.

"Tis not the many oaths that make the truth."

—SHAKESPEARE.

WE observe that many of our Press contemporaries are, as usual at this season of chill November, stimulating the patronage and exciting the hopes of their readers, by offering prizes for essays on various subjects, or for the solution of different conundrums. We are happy to say that the demand for HYGIENE is too genuine to require any incentive of this kind. But if we thought that the case was otherwise, we might feel tempted to hold out the inducement of a ten-guinea prize, to be competed for by believers in patent medicines only—namely, ten boxes of Beecham's Pills,† and the subject of the conundrum-essay would be, "How do you

\* The articles on this subject, which appeared in HYGIENE for 1891, have been reprinted and published in book form under the title of "Patent *alias* Quack Medicines"; 3rd edition, 128 pages, price 1s., post free for 14 stamps. (Beaumont and Co., Limited, 39, Southampton Street, Strand, London.) For contents see our advertising columns. During the present year articles have appeared on Beecham's Pills, Warner's Safe Cure, Morrison's Pills, Baillie's Pills, Dixon's Pills, Lee's Pills, a Quack Libel Case, Modern Mysticism and Mattei's Electricities, Nicholson's Patented Artificial Ear Drums, Electric Belts, St. Jacob's Oil, the Gold Cure for Drunkenness, Unqualified Practitioners, a "Reverend" Specialist, etc. These additional articles will shortly be published in a separate form under the title of "Patent *alias* Quack Medicines," Vol. II., price 1s., post free for 14 stamps. Orders, with remittance, can now be received for either volume.

† "Worth a guinea a box"; see advertisements in the papers. That is Beecham's valuation. "Worth a penny a box"; that is the valuation given in HYGIENE when we had occasion to publish the analysis of Beecham's "pearls of great value"—his own statement, by the way. Both estimates cannot be right; but we are prepared to make a wager (the proceeds

account for the apparent relation between patent medicines and pious language ? ”

In our last number we quoted, from probably his own words, a description of the desperate conflict in a “reverend” specialist’s mind between his devotion to his pastoral work and a presumed call to medical duties. [N.B.—We are not referring to the three-halfpenny stamp on the reverend specialist’s boxes of pills.] If it were not bordering on profanity, in presence of such a noble struggle, we might have compared the reverend specialist with Garrick, as depicted in the famous picture of that actor hesitating whether to adopt tragedy or comedy as his sovereign queen.

We may here explain that the reverend specialist got over his difficulty by arriving at the conclusion expressed in the following unctuous sentence :—“ It seems as sacred to give a man health as to bless him religiously ; but often the one leads to the other.” The “ but ” somehow mars the force and the intelligibility of the sentence. Blessing religiously, too, reminds us of an anecdote of two sailors on board a ship which included a colonial bishop amongst its passengers. The bishop objected to the emphatic manner in which the simple sons of Neptune are wont to express passing sentiments ; and the captain impressed upon the crew the desirability of controlling their feelings, or at least their language, during *that* voyage. The sailors were obedient to orders, and almost mute throughout the early part of the day, owing to the novelty of the restraint put on them ; but in the course of the afternoon one of the men happened to drop a heavy marling-spike upon another’s foot ; turning sharply round, the latter, catching sight of the captain and the bishop close by, roared out, “ *Bless you, Jack !* ” adding in an undertone, “ you know what I mean.” Evidently, the injured sailor stood in little need of one of the “ energisers ” which the reverend specialist

sells for about half-a-crown to anyone willing to part with that coin of the realm ; for not only does the reverend gentleman profess to cure deafness, even where all other remedial measures have failed, but he energises those who need it ; whilst his rhubarb pills (1s. 1½d. a box) are, according to his modest assertion, “ a merciful medicine, more precious than rubies.” But we must leave the reverend specialist ; we have loitered too long, although this a roundabout paper ; and we fear, too, that our publisher, when he sees this article in print, will blame us for giving gratuitous advertisements. However, he cannot say that we have reduced his receipts in that department, as there is an inexorable rule at the office of HYGIENE, as unyielding as the laws of the Medes and Persians, “ No quack advertisements taken.”

Referring further to this religious (?) tendency on the part of patent medicine proprietors, we may remark that one of the largest advertisers of that class heads his monster announcements with a quotation from Deuteronomy, “ For the blood is the life.” The reason for dragging in a Scriptural quotation in this manner is not very evident, except that it be for the purpose of drawing attention, just as the Sequah men draw teeth. Besides, having regard to the fact that Clarke’s Blood Mixture contains a large quantity of iodide of potassium, and that this drug has a powerfully depressing action, making it most unsuitable and improper for administration to the sickly and the debilitated (to whom it is, nevertheless, strongly recommended by the maker), we think that a more satisfactory quotation could have been taken from a verse which occurs later in the same chapter, “ Pour it on the ground ” ; at any rate, this would have had a certain cautionary value, and have suggested some safer way of dealing with the Blood Cure than swallowing it.

As for “ God’s blessing,” patent medicine people use the expression so freely, (to such an irreverent extent as to partake of blasphemy,) that one is almost led to imagine that they regard it

to be handed over to any medical or masonic charity) that our statement is near the truth, and that the advertisements are—well, a long way off it.



as included in the purchase when they buy the Government duty three-halfpenny stamps at Somerset House.

We have lying on our table a book which is supposed to treat of consumption and other chest diseases. At all events the names of these affections appear in gilt letters upon the cover; but on opening it we find only two dozen pages, with frequent digressions in praise of the Balsamic Elixir, concerning these important affections; while about 150 pages are stuffed with testimonials. Yet, in what may, by a straining of the phrase, be termed the technical portion, the author finds himself obliged, at page 22, to utter the plaintive excuse for not describing asthma, that "the limits of the present work will not permit me to enter minutely" into such matters. And, as for the testimonial portion, occupying six-sevenths of the whole book, he says, "Other extracts might be given, but want of space forbids." What a pity it is that his modesty stood so much in his way that he did not utilise the odd twenty-five pages for testimonials; there would have been no loss to science, and the book would have had just as much weight (eight ounces for twopence) when "gradually diffused" through the medium of the post.

On opening this book, which purports to be written, with the exception, we presume, of the 150 pages of testimonials, by one George Thomas Congreve, of Peckham, we find—we felt sure we should—"God's blessing" figuring on the very first page; G. T. C. expressing the hope that "by gradually diffused knowledge"—we once heard an advertising agent and bill-sticker described as a "professor of *applied* literature," is this the sort of gradual diffusion meant?—"a just appreciation of these means and their principles of operation will so arise that, with God's blessing, the benefits accruing therefrom may be extended into distant lands, as well as more widely in our own." Opinions differ; consequently, there are doubtless some who will entertain opposite views to Mr. Congreve, both as to the "principles of

operation" and the desirability of invoking the Divine benediction upon them.

The preface to Mr. Congreve's book of testimonials is amusingly contradictory. He is at great pains to explain that for many years his attention has been "earnestly directed" to the study of pulmonary disease; first with his father, then as a pupil of the "late J. R. Hancorn" (whom it is to be hoped he treated with a little more respect when speaking of him in his lifetime than he does now in writing of him), and afterwards in the medical schools and hospitals of London, where he "attended all the courses of lectures and clinical practice required of the medical student." The medical schools and hospitals of London are numerous, and we cannot help thinking that it would have facilitated Mr. Congreve's studies had he applied himself steadily to work at one institution, instead of imitating the bee, roving from place to place in quest of honey—Balsamic Elixir, we should perhaps have said.

A country squire whose son was, like Mr. Congreve, in a position to boast in the plural number of the seats of learning with which he was acquainted, was descanting upon the subject to one of his tenants, and commented upon the remarkable circumstance that the young Hopeful had enjoyed the exceptional advantage of being educated at two universities. "There isn't much in that," replied the old farmer, who had not the high opinion of the young squire's mental abilities that the father had; "why, I once had a calf that sucked two cows, and the more he sucked the bigger calf he grew."

Well, supposing that Mr. Congreve's father was a medical practitioner, although, by the way, Mr. Congreve does not vouchsafe any information on this point; that J. R. Hancorn (it goes against the grain to have to speak thus familiarly of the eminent surgeon who had the inestimable honour of imparting the principles of special knowledge to Mr. Congreve) "had an extensive practice in cases of consumption," as Mr. Congreve asserts; and that Mr. Congreve

attended all the hospitals and medical schools of London, and all the courses of lectures required of the medical student, there is a certain something which should be explained, and that is, why Mr. Congreve omitted what is required, or expected, of every student—namely, to pass an examination at one or more of the colleges, affording evidence of proficiency, and qualifying for medical practice. Perhaps, despite the all-absorbing character of his medical studies, he stole an occasional half-hour for the perusal of Shakespeare, and the following passage in *King John* struck his fancy as appropriate to his case :

“Therefore, to be possess’d with double pomp,  
To guard a title that was rich before,  
To gild refined gold, to paint the lily,  
To throw a perfume on the violet,  
To smooth the ice, or add another hue  
Unto the rainbow, or with taper light  
To seek the beauteous eye of heaven to garnish,  
Is wasteful, and ridiculous excess.”

Whether such a supposition is correct, or not, cannot be determined here ; but one thing is a fact—viz., that Mr. Congreve does not think it expedient to wholly disregard professional qualifications, for he tells us, in imposing capital letters, “I have much pleasure to announce that I have secured the valuable assistance of my son-in-law, J. Alex. Brown, M.R.C.S., L.S.A., who has now been with me some years. In my absence patients will be carefully attended to by him.” Anyone with a little imaginative power might think he was reading of a modern Laban, a second Jacob. But Laban limited Jacob to looking after sheep, while Mr. Congreve entrusts his son-in-law with the charge of patients in his (Mr. Congreve’s) absence. What, we wonder, do the patients, if they share Mr. Congreve’s lofty contempt for medical qualifications, say to this “wasteful and ridiculous excess” ? And what ought the Medical Council to say to such an extraordinary arrangement ?

The “reverend” specialist referred to in our previous article employed “a physician in attendance” obviously as “a cover,” but if this be Mr. Congreve’s motive for securing the

valuable assistance of his son-in-law, it could not avail him much in the event of proceedings being taken for illegal practice, for he naively admits that J. Alex. Brown, M.R.C.S., L.S.A., is permitted to see Mr. Congreve’s patients only when Mr. Congreve is absent ; to use a phrase common amongst boys sliding on the ice, J. Alex. Brown’s sole function and privilege appear to be to “keep the pot a boiling.”

As Mr. Congreve reminds his readers in the cheerful (?) Christian style which pervades the entire book, there is “an appointed time for man on earth,” and if anyone wishes to personally obtain the “*God-provided* remedy for poor suffering humanity” (as the Balsamic Elixir is as beautifully as truthfully described at page 87), he must present himself at Mr. Congreve’s residence on certain days at stated hours, when he can consult Mr. Congreve, or, in his absence, J. Alex. Brown.

Some anxious inquirer may despondingly suggest such a misfortune as the absence of both of these individuals. We hasten to dispel the gathering gloom which must result from even the bare idea of such a calamity. “In order that the world at large might derive the benefit of their use,” Mr. Congreve tells us that these “*God-provided* remedies,” “prepared solely by me, at my residence” &c.—that accounts for the days on which he cannot be seen, we suppose—have been “introduced in the form of *proprietary* medicines,” which can be had of any respectable chemist.

Imaginary conversation in a village shop.—“Are you a *respectable* chemist ?” “Why, certainly.” “Then I want a bottle of Mr. Congreve’s ‘*God-provided*’ Balsamic Elixir.” “Yes, madame ; small or large size ? Mr. Congreve, the sole provider, I mean preparer, says, ‘The circumstances of the patient permitting, it is much better to have the latter—a saving of trouble and expense.’” “What is the price ?” “‘Family bottles’ are 11s. and 22s.” “Give me a twenty-two shilling bottle ; it is so much cheaper than paying from five shillings



upwards to a qualified medical man who, of course—at least, so I infer from Mr. Congreve's book—would not know anything about my case."

Mr. Congreve doesn't seem to mind what trouble he takes. "I am not actuated solely by ideas of pecuniary gain, but a sincere desire to benefit my fellow-creatures as much as my own advantage," he tells us in his book. Nay, more, he doesn't mind, apparently, how much trouble he is put to, in addition to solely preparing the remedies, for he specially remarks—using italics to emphasise the fact of his earnestness—"when-ever the two larger sizes are required, it is better to obtain them direct from me." This admonition is needed, for otherwise the thoughtless patient might imagine it would be a saving of trouble and expense to buy of some chemist—respectable chemist, of course—nearer home. Why, there is one not far from our office who actually sells the 11s. size for 8s. 9d., and the 22s. family bottle for 17s. 6d., as we learn from his price-list. We have never made such wholesale purchases of any patent medicines. Life is not long enough for such experiments, let alone our purse; but if we ever found ourselves disposed to indulge in such "wasteful and ridiculous excess," as regards the Balsamic Elixir, we should probably take the first omnibus to Peckham, carefully sitting back in a corner as we passed the lunatic asylums, and save trouble and expense (?) by paying the full price into the hands that had solely prepared this *God-provided* nectar. It is so much more satisfactory to get a bottle of wine direct from the original bin than to have it from the public-house round the corner.

Now, what on earth could have put this last idea into our mind? Why, we read some time ago in the *Provincial Medical Journal* an article in which the Balsamic Elixir was irreverently compared to diluted "publican's port," *plus* a little Friar's Balsam, also known as the compound tincture of benzoin. Such a concoction could not, by the greatest stretch of language,

be rightly termed *God-provided*, and we have therefore had the stuff recently analysed. The analyst, a gentleman of many years' experience, reports thus:—"It seems to be made of infusion of elderberries, a little alcohol and benzoic acid, with a little flavouring (allspice)." There is an old Scotch proverb that "Many a little makes a mickle." If so, the "mickle" in this case is all on the side of the sole preparer, and not in favour of the consumer. Country-born and country-bred, we admit an inherent weakness on a cold winter's night for mulled elderberry wine, *plus* sugar, *plus* spice, but we should strenuously object to its being "mulled" by the addition of compound tincture of benzoin, *alias* Friar's Balsam.

As for the properties of *this* beverage—we are speaking now of good, honest, unsophisticated elderberry wine—they are too well known for us to describe them; but as for the remedial properties of *that other* concoction—Congreve's Balsamic Elixir to wit—we most unhesitatingly and positively assert that it has no power whatever to prevent or modify tubercular deposits, to heal ulcerated lung-tissue, or to cope with the various pathological conditions giving rise to asthma and other chest affections alleged to be cured by the administration of the Balsamic Elixir; no, not even if such were affirmed in twenty times the number of testimonials put forward by Mr. Congreve. "'Tis not the many oaths that make the truth," as Shakespeare observed.

Our article has already run to such a length that we cannot make room for any extended comments on certain much-advertised proprietary medicines which we had intended to write about. One of these is Owbridge's Lung Tonic; a second is "Dr." Lane's Catarrh Cure, sold at "Professor" Brown's depôt for herbal medicines, in a street near Covent Garden. Frequent newspaper advertisements exhort people to "save your lives by taking Owbridge's Lung Tonic"; and the proprietors of the Catarrh Cure insist upon the statement that its use as a gargle will prevent

consumption. How far the facts will agree with the assertion may be readily realised when we mention that the tell-tale test-tube of our analyst makes us acquainted with the fact that the simple solution of a drachm of carbolic acid in a pint of water (both cheap ingredients) furnishes a compound closely proximate to the contents of a 4s. 6d. bottle of the infallible herbal (!) consumption preventer.

The other life-preserver, Owbridge's Lung Tonic, turns out to be composed chiefly of balsam of tolu, with the oils of aniseed and of cloves. Aromatic, warming, and not unpleasant to the palate, but possessing one quality in common with the two preparations already described—the Balsamic Elixir and the Catarrh Cure—namely, utter uselessness for the prevention or cure of the fell disease, consumption.

A clergyman in one of the Eastern counties has sent us a copy of a travelling-van quack's certificate, given to a labouring man for the purpose of obtaining sick relief from a benefit club :—

"This is to certify that — is sufering from yaler janders and not abel to work.

"G. LEWIS, M.D., U.S.A."

The originality of the spelling is sufficiently striking ; but there is another peculiarity about the certificate, and that is, that the U was scrawled, with a long first stroke, so as to resemble the letter L ; the obvious purpose being to convey to ignorant or unsuspecting persons that, besides the doubtless assumed degree of M.D., the writer of the certificate possessed the L.S.A. qualification. Our subscriber, happening to see the certificate, made some inquiries, which had the effect of promptly relieving his parish of the impostor. What a pity it is that there are not more clerical gentlemen ready, like this one, to expose quackery, instead of many being so easily led into giving testimonials about matters that they probably know nothing at all of.

As this is the last article of this series for the fast-waning year, we take the opportunity to

thank our subscribers and other friends for the kind co-operation and cordial encouragement which they have given us in our somewhat arduous task ; and we trust that we may count upon the continuance of these friendly sentiments in 1893.

We most heartily wish them all a Merry Christmas (no publican's port, please !) and a Happy New Year.

THE EDITOR.

## PHYSICAL EDUCATION.

By GEORGE WHITE, B.A., LL.B., Chairman of the London School Board Committee on Physical Education.

THE subject of physical education, especially in elementary schools, is one which, within the last few years, has attracted much greater attention than formerly ; and this increased attention is one among many other phenomena indicative of the change which within the last decade the meaning of the word education has undergone. For, whereas, in days gone by education meant the cramming or acquiring of a given quantity of mere information, it now has a much more extensive and developed meaning, both as to what it connotes and what it denotes. At last educationists are beginning to realise the natural interdependence of bodily and mental functions, and the consequent necessity of creating perfect physiological and psychological conditions in order to conduce to the harmonious working of the various parts of the human system and its functions, and to produce the maximum of result with the minimum of effort ; or, in other words, that the educational efforts of the individual should be attended with the maximum of pleasure and the minimum of pain.

The Education Department has given an impetus to this greater attention by introducing into its Code an article which recognises the utility of apportioning some period of the school time to instruction in some form of physical education by allowing such instruction to be



included in the ordinary time-table of the school. Article 12 (*f*) of the Code of Regulations in 1891, for the first time provides that "in making up the minimum time constituting an attendance, may be reckoned time occupied by instruction in suitable physical exercises and military drill."

And such bodies as the National Physical Recreation Society, the German Gymnastic Society, the Swedish Gymnastic Society, the National Union of Physical Training Teachers, and other organisations of the kind, with their consequent rivalries, are similar indications of a wave of thought passing over the country in favour of attention being given in various ways to physical as distinct from intellectual development.

The term physical education, used as denoting a subject for school instruction, has not such a wide meaning as when used generally. Its object in the former sense being partly to secure the best conditions for mental effort by promoting the best physical conditions, it includes such instruction as leads to uniform and harmonious development of the whole body of the individual child, with due regard to its physical idiosyncracies, or any accidental or abnormal characteristics which may differentiate him from an ordinary generic child living under normal conditions. It does not include such specific or extraordinary exercise and education as lead to the powerful arms and shoulders of the rower, legs of the runner, body of the pugilist, or the mighty physique of the professional athlete, nor anything that develops acrobatic aptitudes. Its limits, therefore, with respect to the school, and the conditions for its healthy prosecution, can be easily defined and formulated.

One of the greatest difficulties that a teacher has to deal with in the management of young pupils is the desire for change, and the natural predisposition to physical activity which always accompany infancy and early youth. The skilful teacher is he who knows how to utilise these most advantageously to make the school life of

his pupils happy and interesting. The time selected for physical exercises should not be so close to the time for meals as to create any undue strain or any antagonism between the physical functions involved in digestion, and those concerned in mere physical exercises as such, nor so placed in the time-table as to cause any antagonism between physical and cerebral functions. Probably a period midway in the time apportioned to mental subjects would be the best to allot to them. And inasmuch as practice and instruction in such exercises as can be taught to pupils between five and fourteen involve a certain amount of free movement for all parts of the body, and necessitate standing in a more or less erect posture, it would be best to arrange it in some part of the time-table preceded and followed by lessons which require sitting; otherwise weariness, lassitude, and undue strain and effort would result. It need hardly be pointed out that the healthy prosecution of physical education requires the best atmospheric surroundings. A lesson on physical exercises ought if possible to be given in the pure, open air, of course with proper regard to temperature. A large shed in the school playground would be useful for the purpose, or a large hall in the school itself. The structure of a school, therefore, cannot be said to be perfect unless it includes one of three things: (*a*) a large shed, open at the sides, in the playground; or (*b*) a hall in the school, well lighted and ventilated, to which each class can be drafted in turn; or (*c*) plenty of floor space in each classroom, unencumbered by desks, well lighted and ventilated. This latter, however, which is suggested as an undesirable alternative when there is no other, makes it almost impossible for any exercises involving marching or change of position to be practised.

Apart from its more general hygienic results, the advantages attendant upon the teaching of physical exercises as a school subject are manifold. As a great mechanical help to school discipline it is invaluable, partly on account

of the habits of ready obedience and attention to the commands and wishes of the teacher which it engenders, and partly as affording the means of securing a variety of posture and attitude to satisfy the demands of that vitality and activity which the young, under natural conditions, always exhibit.

The indirect effects it has are equally inestimable. Its aim, and result too, if properly taught, being to make children healthy and well developed, exercising in turn each separate part and function of the human body, it powerfully counteracts any hereditary predispositions to disease which may be present, and minimises their injurious tendencies. This can, perhaps, be best illustrated by a series of exercises designed for the expansion of the chest and shoulders. Their hygienic effect must be at once obvious.

The object of teaching physical exercises in schools being partly to secure rest and diversion from intellectual toil, and partly to make children healthy and to secure the maximum of their bodily development, it seems that they cannot be taught at too early a period in the school age, which is taken for practical purposes, as before mentioned, to be from five to fourteen. In the *infants'* school, exercises simple in character, but designed to afford development in turn to each part of the body, should be taught. Here, if at all, appears to be the only place where musical accompaniment to the exercises is desirable. For very young children such accompaniment may help towards precision of movement, and the rhythmical sounds and the pleasure resulting from sweet melodies or harmonies may add to the recreative character of the lesson. In schools for older boys and girls, however, it is doubtful, I think, whether such musical accompaniment should be encouraged. There certainly cannot be two opinions as to the undesirability of allowing children to whistle and sing their own accompaniment, which I understand to be the method with some systems, while practising physical exercises. In *girls'* schools a little reform in the matter of

dress is requisite for the healthy performance of such exercises as ought to be taught. Without going into details, each part of the girl's dress should be so arranged as to allow of free, unconstrained movement of the muscles and the limbs. Probably the kind of exercises taught to *boys* at school ought not to vary greatly from that taught to girls. The main object with girls, however, being to secure regular development and harmony of form; while, with boys, this being a secondary object to the promotion and general diffusion of muscular strength, and to their proper equipment to discharge their duties as useful citizens, in the highest classes physical exercises may be localised and specialised with respect to their future and prospective callings. The average physique and stamina of a boy being greater than that of a girl, probably the exercises may be of a little more violent nature, and practised for a longer period than in the case of girls. Military drill ought undoubtedly to supplement the ordinary physical exercises for boys. It teaches them to walk in a regular step and manner better than any other form of physical exercises; accustoms them to grouping and forming ordered masses, and indirectly shows them the value of co-operation and the necessity and advantages of discipline.

It will be gathered from the foregoing remarks that a typical lesson on physical exercises should embrace one or more movements for each part of the body, first of a simple character, and then graduated up to more difficult and complicated ones. The length of time necessary and desirable should be sufficient to afford recreation and relief from the intellectual labour involved in the lessons preceding and following, but should not be so long as to produce weariness and fatigue, which may be as injurious as indigestion. Individually weak pupils may, therefore require special attention. But what should be aimed at is that there should be proper moderation and frequent repetition of the exercises. The aim and object of the exercises should, so far as the pupil is capable of under-



standing them, be taught with each exercise; and for this purpose a technical and scientific knowledge of physiology and anatomy is required on the part of the teacher.

In the training of teachers, therefore, for instructors in physical exercises, there should be careful study of the human frame—of the different systems which go to make up its structure, their interdependence and interaction one upon another. With each branch of theory there should be its practical application to physical education and physical exercises. When, for example, the physiology, anatomy, and functions of the leg are being studied, particular exercises designed to develop the leg, and make the performance of its functions easy and natural, should be practised.

In the Swedish system of exercises, which probably has been elaborated more than any other, there are different sections devoted to—(1) pedagogic exercises; (2) military gymnastics; (3) medical gymnastics. In each branch the exercises are selected, and their order formulated to promote the immediate object in view, physiological and anatomical research and study forming the basis, and the theory and practice being taught side by side, whichever course is undergone.

The physical exercises or gymnastics suitable for the school are, of course, different from those practicable for the period of adolescence or for the adult. Exercises with apparatus involve more or less severe strain, and this severe muscular effort may seriously affect the development of the young subject. On many other grounds, too many to be here given and explained, the use of apparatus by children at school is to be deprecated, the aim with regard to them being not at localising the muscular effort over a limited region, but, on the contrary, to generalise it by distributing it over a large number of muscles at the same time—not to induce fatigue quickly, but rather to bring all the functions into greater activity. As to the mechanical adjunct of musical accompaniment, it, no doubt, adds an

element of recreation and pleasure to the exercises, especially to young children, but in elementary schools it is problematical whether it should be insisted upon for older children.

The evils consequent upon the absence of a systematic and universal provision for instruction in physical exercises are no doubt minimised, and have been prevented from obtruding themselves on public attention, by the practical outcome of that desire for activity and natural necessity for exercise which every healthy human being, whether youth or adult, instinctively and spontaneously feels impelled to, in the shape of games and sport. Any organised system of physical exercises should be used as a supplement to, and not as a substitute for, games. On the other hand, many games may be utilised so as to afford subject-matter for the practical application of the elements taught in physical exercises. One of the best of such practical applications is swimming, the movements in which bring into action, perhaps, more of the muscles of the body than any other form of exercise. Its value, therefore, estimated as a subject of school instruction, and as a branch of physical education, apart from the skill and bodily dexterity which it involves and the material advantage resulting therefrom, seems to me to be incommensurable. It affords subject-matter for a kind of counterpart of physical education on land; and no child can be said to have a complete physical education until it has been taught how properly to use its limbs, and how to exercise all its muscles both in the water and out of it. No school, therefore, can be said to have its educational machinery complete unless it includes in it ample accommodation for the teaching of all its children how to swim. The London School Board has recognised this by resolving, wherever proper public bath accommodation available for the purpose of instruction in swimming is not provided, to build in its new schools swimming baths, in order that all the boys and girls attending its schools may have their education complete in this particular.

But much has yet to be done to secure that physical education should be more general than it is. Its aim in schools is hygienic, and not skill.

### DR. NANSEN ON STIMULANTS AND NARCOTICS IN COLD CLIMATES.

THE approach of winter gives great interest to some remarkable passages in Dr. Fridtjof Nansen's "The First Crossing of Greenland." This famous traveller and born leader of men shot to the front rank among scientific explorers and discoverers as soon as it was known that he had successfully crossed Greenland, and he thoroughly deserved the honour. Seldom has any triumph of equal magnitude been achieved by anyone. One has to bear in mind the apparent poverty of the explorer, and his absolute dependence on the help of others. Many Arctic explorers have found themselves placed at the head of a splendid expedition, fitted up regardless of expense and strongly manned; Dr. Nansen was poor, very poor. He applied for a paltry £275 in aid of his expenses to the Norwegian University; and the Council passed on the modest application to the Government, and the latter positively declined to help, and Nansen had to depend on the munificence of Herr Augustin Gamél, a foreign gentleman living at Copenhagen, for the means to start. All Nansen wanted was to be taken to the East Coast of Greenland by some whaler, and, on leaving the ship, he daringly proposed crossing the ice on foot and getting to land as best he could, and then he and his companions proposed to fight their way, yard by yard, across the inland ice and the lofty mountains of Greenland to the West Coast. The distance was only 420 miles, but the little expedition would have to carry with it, in light hand-drawn sledges, a full supply of food and fuel for several months. All this Dr. Nansen has brilliantly described in his classical work. Suffice it to say that

he and his five heroic companions fought their painful way over snow and ice, dangerous mountains, and in the teeth of piercing cold, successfully accomplishing the object in view, and crossing Greenland for the first time in history.

On all such expeditions the supply of warm drink is a most important matter, and on this occasion we may well suppose that what to take and how much were anxious questions. Dr. Nansen took a good supply of cocoa or chocolate, tea, coffee extract, and spirits, besides some beer; tobacco was also not left out. The spirits were, however, mainly to be used as fuel. We may now quote from our author:—

"For warm drink, which, though no necessity, is undoubtedly a great comfort, we generally used chocolate in the morning and pea soup in the evening. We also took tea and coffee, the latter in the form of extract, of which we had rather more than a quart. After having had this two or three times in the afternoon and evening, and found that, though it made us feel better and cheered us up for the time, we got little or no sleep in the night afterwards, I confined its use to a morning now and then. But, as it did not seem to suit us even at this time of day, it was finally tabooed altogether till we had almost reached the West Coast, much to the despair of the Lapps. Tea, as far as I can judge, does considerably less harm, and is besides a very refreshing drink. We often used weak tea, with condensed milk and a little sugar, especially in the morning after all our chocolate was gone. My experience, however, leads me to take a decided stand against the use of stimulants and narcotics of all kinds, from tea and coffee on the one hand to tobacco and alcoholic drinks on the other. It may be a sound principle at all times that we should live in as natural and simple a way as possible, and especially must this be the case when the life is the life of severe exertion in an extremely cold climate. The idea that one gains by stimulating body and mind by artificial means betrays not only, in my opinion, ignorance of the simplest physiological laws, but



also a want of experience, or perhaps a want of capacity to learn from experience by observation. It seems, indeed, quite simple and obvious that one can get nothing in this life without paying for it in one way or another, and that artificial stimulants, even if they had not the directly injurious effect which they undoubtedly have, can produce nothing but a temporary excitement, followed by a corresponding reaction. Stimulants of this kind, with the exception of chocolate, which is mild in its effect, and at the same time nourishing, bring practically no nutritive substance into the body, and the energy which one obtains in anticipation by their use at one moment must be paid for by a corresponding exhaustion at the next. It may, no doubt, be advanced that there are occasions when a momentary supply of energy is necessary, but to this I would answer that I cannot imagine such a state of things arising in the course of a protracted sledge expedition, when regular and steady work is required. It is often supposed that even though spirits are not intended for daily use they ought to be taken upon an expedition for medicinal purposes. I would readily acknowledge this if anyone could show me a single case in which such a remedy is necessary, but till this is done I shall maintain that this pretext is not sufficient, and that the best course is to banish alcoholic drinks from the list of necessities on an Arctic expedition. Though tobacco is less destructive than alcohol, still, whether it is smoked or chewed, it has an extremely harmful effect upon men who are engaged in severe physical exertion, and not least so when the supply of food is not abundant. Tobacco has not only an injurious influence upon the digestion, but it lessens the strength of the body and reduces nervous power, capacity for endurance, and tenacity of purpose. With regard to the complete prohibition of tobacco in Arctic work, there is one circumstance to be borne in mind, which has not to be considered in connection with spirits, as habitual hard drinkers are scarcely likely to take part in these

expeditions, the circumstances that most men are so accustomed to its use that they will keenly feel the want of it. For this reason it would be advisable not to take excessive smokers or chewers of tobacco at all."

In another place, Nansen speaks of meat powder chocolate as especially useful, because it is both nourishing and palatable. The expedition, although every pound weight was of importance, actually took forty-five pounds of this chocolate preparation. Dr. Nansen speaks of the particularly invigorating effect it had on the members of the party, and he adds that, if a sufficient amount of fat were mixed with it, and it was taken in small quantities at a time, it would prove a most excellent food for men on the move; while, compared with pemmican, it is very easy of digestion. The reader must not forget that in an Arctic climate, especially when traversing the Greenland mountains, fat is a prime necessary of life—indeed, life can only be maintained on large quantities; hence it may well be that perfectly pure and delicate preparations of cocoa, like Cadbury's cocoa essence, from which two-thirds of the cocoa butter has been expressed, and which contains no admixture of starch or sugar, might be less suitable than some form from which the rich and somewhat indigestible cocoa butter had not been in part removed. No doubt the enterprising manufacturers of this favourite and excellent brand could easily prepare a form from which the butter had not been removed, and the excess of fat would be invaluable in an arctic climate, though unnecessary in our milder latitudes. But it is well to add that Nansen makes much of the importance of perfectly pure cocoa and chocolate. There is no reason to suppose that he would have encumbered himself with preparations charged with alkalies, like so many of the Dutch scented cocoas, which are now being forced on our English markets, much to the injury of our own makers and countrymen. Dr. Nansen did not take any Dutch cocoa with him; though he sent to a foreign land for his supplies.

Some of our readers may accuse us of confounding adulterations with mere additions or substitutions of cheaper, but still perfectly harmless, ingredients for the dearer cocoa. Let us make our meaning plain. Starch and sugar are often added to cocoa—indeed, sugar and various flavouring substances, like vanilla, are used, and perfectly legitimately, in the preparation of chocolate, and as long as the maker does not call chocolate cocoa, and the latter signifies, or should signify, the pure unmixed preparation, there is no fraud; but many firms sell a mixture consisting of a very little cocoa and a very great deal of starch or sugar as pure cocoa. This is fraudulent, for sugar and starch are far cheaper than cocoa. Again, some firms add alkalies and dangerous adulterations to their cocoa, and then have the audacity to call it pure cocoa, while, again, as we have just seen, some other firms add alcohol to their chocolate creams, thus producing sweetmeats highly charged with alcohol, and which may lead to children, the principal eaters of these delicacies, getting to like alcohol, and so laying the foundation of intemperate habits in later life.

No wonder, after all that has come to light as to its excellence, that the manufacturers of Cadbury's cocoa essence should claim that it is absolutely pure, and that it has no superior in the market as far as wholesomeness, purity, economy, and agreeableness go. Many of the Dutch cocoas, with which, to the disgrace of our country, the English market is flooded, are preparations of cocoa, combined with strong and injurious alkalies; while they are not so cheap as they are represented to be, because, though when mixed with water they make a strong looking compound, they give, in plain English, a soap, the alkalies present helping to give an appearance of fictitious strength and richness. No wonder that Cadbury Brothers earnestly appeal to the medical profession to discountenance to the utmost of its power the use of these foreign adulterated perfumed cocoas, and to encourage the consumption of pure home-made preparations like their cocoa

essence, which has received the unqualified support of large numbers of eminent physicians and surgeons.

But alkalies, starch, and sugar are not the only adulterations and additions to be guarded against, which some foreign makers put in their wares. Only the other day, a startling paragraph went the round of the London papers that the Customs Board had been compelled to declare that foreign chocolate creams would not be delivered to the consignees until they had been analysed and been proved to be pure. This led to a curious correspondence, and a firm letter from the Customs Board to the effect that parcels of foreign chocolate creams had been examined and found to contain large quantities of spirits, rather a serious addition to the sweetmeats so lavishly given to young children. It is not clear that those alcoholic and fiery sweetmeats will be absolutely prohibited, but it is certain that they will not be allowed to be sold until they have paid the customary duty levied on foreign spirit, and, no doubt, the sellers will need a spirit licence.

Such are some of the dangers to which unprincipled foreign competition exposes us; would any other civilised country submit to such a state of things?

One of the most remarkable passages in Dr. Nansen's charming narrative is the one describing the first landing on the East Coast of Greenland, and the feeling of gratitude and hope that filled his mind. He had promised his party, he tells us, a good allowance of chocolate in honour of the occasion. However far man may wander, however high his thoughts may rise, he is sadly dependent on his stomach, and Dr. Nansen tells us that "the cooker had to be put upon a rock down by the boats, and the chocolate set under way, and then, after long and dreary waiting for the delicious beverage or food, for chocolate, unlike tea or coffee, is both," he continues, "at last the long-expected chocolate was ready, and six patient throats could at last enjoy deep draughts of the glorious nectar. It was indeed a



divine repast, surpassing anything we had had hitherto ; we deserved it, and equally well enjoyed it, and our spirits were at the height of animation."

We hope that, should Dr. Nansen be able to carry out his proposed expedition to the North Pole, he will take a large quantity of cocoa prepared by one of our leading English makers. Some of our famous firms would, we should think, be delighted to prepare a suitable form of cocoa or chocolate, and to fit out the expedition with it. English philanthropy and energy are never backward in good works.

A PHYSICIAN.

### OYSTERS.

By J. LAWRENCE-HAMILTON, M.R.C.S.

THE United States Government has granted a sum of about £84,600 for research and investigations to advance its fishing industries, thus conferring a boon upon all countries having fisheries. Among the numerous recent illustrated monographs of the United States Fish Commission is a volume of reports from chemical analysts engaged in the State laboratory, at Wood's Holl, Massachusetts. This exhaustive treatise is so full of practical information and technical instruction, that its contents demand the consideration of everyone anxious to understand the results of the up-to-date science bearing upon this branch of our food supply. The dietetic value of oysters is attributed to their flesh-forming and heat-and-force-giving constituents. Some analytical chemists declare that, weight for weight, oysters have a nutritive value fully equal to the same weight of milk, but, as a dietetic agent, they are far superior to milk. Experience proves that many with whom milk disagrees can digest with pleasure a number of good fresh, healthy oysters. The ancient Romans chewed oysters raw, to bring out the full flavour of the mollusc and

make it more readily digestible. It is an error to swallow the oyster whole, or cooked. Cooking coagulates and hardens the oysters, destroys their flavour, and renders them indigestible. Oysters of different breeds and ages, from different localities, differently fed, grown under different chemical and physical conditions, including the extent and variety of their food, present varying properties and values as articles of diet. As the oyster grows older, its proportion of flesh and juices increase more rapidly than its shell, as well as the relative amount of the natural nutrients in its edible portions. Deducting their shells and juices, one quart or 2 lbs. of oysters yield  $2\frac{3}{4}$  to  $5\frac{1}{4}$  ounces of flesh. The American analyses show that the oyster's flesh and liquids contain from 84·8 to 91·5 per cent. of water combined with the nutrients, which vary from 8·5 to 18·3 per cent. The average of thirty-four analyses gave 87·3 per cent. of water with 12·7 per cent. of nutrients. (The liquids in the oyster are chiefly water and sea-salts.) The value of a food includes its digestibility, its flavour, variety, or change ; its effect on other food taken at or about the same time, and its action in improving or in disturbing the normal secretions concerned in the united healthy processes of digestion and absorption. Thus, for example, chemical analysis, together with microscopic and bacteriological examination of two similar joints of meat taken from similar animals, apparently equally good and healthy, and exposed to the same conditions of preparation, preservation, and cooking, might appear identical in every detail to the skilled scientist.

Nevertheless, one of these joints might be of excellent taste, tenderness, and flavour, and eat, digest, and nourish excellently well ; whilst the other joint might be tough, harsh, dry, insipid, and so indigestible as to cause passing illness. This is another proof that digestion is not a mere test-tube reaction. Again, these analyses prove that the large percentages of phosphorus formerly alleged to exist in fish is an error. The flesh of aquatic animals does not contain a

## PUBLIC HEALTH REPORTS.

higher percentage of phosphorus than that found in meat, game, and poultry. There is no experimental evidence to show that, for nourishing the brain, fish is more valuable than meat and many other foods. The trade trick called "plumping," "fattening," "floating," "laying out," or "bloating" oysters by removing them in their shells from their home in the sea to less saline waters, where they are kept from six hours to four days (averaging forty-eight hours) to increase their bulk by an artificially produced dropsy, so as to enhance their selling value, is a growing abuse in the United States, the United Kingdom, and other oyster-eating countries. Whilst in their shells, these sodden oysters are forced to absorb about 17.2 per cent. of water, or to gain by "Osmosis" (the diffusion of liquids through porous partitions or membranes) from one-eighth to one-fifth in bulk. This process deteriorates the oyster's flesh, thus forfeiting from one-sixth to one-seventh of its mineral salts, one-eighth of its carbo-hydrates, and one-twelfth of its fats. The addition either of warm water less salt than the sea in which the oysters originally lived, or of water containing oatmeal, speedily thickens the natural secretions adhering to their external surface. Oysters living in too little water make it slimy and supersaturated with their waste products, which cause the sickening and death of the molluscs. Wealthy ancient Romans constructed artificial aquaria in their houses to keep oysters fresh and healthy. The retail dealer may also, immediately after the oyster has been cut out of its shell, and prior to selling it to the consumer, give the unfortunate animal another enforced drink of fresh water, at about 65° to 70° F., to further "plump" all its available anatomy. Such artificial doubly drop-sical oysters supply an inferior food, which invalids and those having weak digestions should avoid.

[Much interesting information concerning oysters will be found in an article by Dr. Crespi, *HYGIENE*, Vol. III., No. 35; and in Dr. Philpot's work, entitled "Oysters and All About Them."—Ed., *HYGIENE*.]

*Newcastle-on-Tyne.*—During the twelve months dealt with in the Report drawn up by Dr. Henry Armstrong, the death-rate of this populous city (with an estimated population of 187,502 inhabitants) was 23.6 per 1,000 as against 26.2 in the previous year, while the birth-rate fell in the same periods from 40.5 to 35.7. The death-rate would undoubtedly have been still more reduced but for the greatly increased mortality from diseases of the respiratory organs, in many instances connected with influenza, which occurred during the last six weeks of 1891; when the death-rate reached the alarmingly high average of 35.8 per 1,000 per annum.

Zymotic diseases caused a total of 478 deaths, and it is notable that of these fatal cases from infectious diseases 179 were from whooping cough, and 128 from measles. Writing concerning the last-named disease, Dr. Henry Armstrong argues forcibly in favour of this being placed amongst the list of compulsorily notifiable affections; a point upon which we believe that all sound sanitarians will be of accord with the experienced medical officer of health for Newcastle-on-Tyne. "Measles," Dr. Armstrong observes, "is a deadly disease, of which we have no official knowledge, except what comes too late for us to benefit by. Is there no remedy for this? Are we fatalists that we sit with folded hands and bowed heads—as before the inevitable—waiting for the destroyer to do his worst on our dear ones? Does not experience afford good ground for hope that this foe, like others of his kind, may be subdued, if not entirely overcome? Do not our records show that other epidemic diseases, of which we have had timely information, have yielded to prompt and energetic hygienic measures which, so far as human judgment can foresee, will be equally efficacious protection in the one case as in the other?" These per-



tinent questions can be answered only in one way. Of course, certain arguments are adduced by the opponents to the notification of measles, but they are untenable in their character. For instance, the great expense which would be involved; but, seeing that notification of measles would most certainly lead to the speedy stamping out of epidemics of measles, the number of cases that would have to be reported would be proportionately smaller; though the question of a few pounds, more or less, for notification expenses ought not to have any weight under the circumstances. Another objection which has been raised is, that as measles is infectious for a few days before it is recognisable, we could not derive full benefit from notification, as regards checking the spread of the disease; but a similar objection might be raised to the notification of typhus or small-pox. Yet, all the 19 cases of typhus reported during the twelve months were removed to the hospital, and not a single death occurred. As 82 per cent. of these cases happened in families occupying one or, at the most, two rooms, it is natural to infer that the disease would have assumed epidemic proportions but for the timely measures which notification enabled the sanitary authorities to take.

Under the heading of puerperal fever it is mentioned that one confinement, in connection with which a case occurred, had been attended by a midwife, who was cautioned against attending any more confinements until after the lapse of two months. This injunction was duly observed; and the Sanitary Committee granted compensation to the midwife for the loss of business during that period.

In accordance with the provisions of the Customs and Inland Revenue Act, 1890, whereby exemption from inhabited house duty can be claimed if a certificate of sanitary completeness be obtained from the medical officer of health, tenement property occupied by about 300 families was carefully examined; the result being that, as none of the houses thus examined

reached the standard of sanitary requirements, no certificate was given.

The general work of the Sanitary Department was alike considerable and satisfactorily executed. During the year the several sections of the department have been reorganised; the number of assistant inspectors of nuisances has been doubled; the inspection of common lodging-houses has been transferred from the police to the Health Department; the abolition of privy middens has been steadily persevered in; and a mass of miscellaneous sanitary inspections and operations have been carried out. Especially are the authorities to be commended for their continuous efforts to abolish privy middens, a condition of things which ought not to be tolerated in any urban district. Still, much remains to be done in this respect at Newcastle-on-Tyne, judging from some excellent remarks on the subject, contained in the report of Mr. W. H. Wells, the chief inspector, who is also the inspector under the Food and Drugs Adulteration Acts. The total of samples taken for analysis during the year was 144, chiefly of milk; it is some satisfaction to learn that out of this number 124 proved to be genuine. The amount of penalties inflicted on delinquent tradesmen was £28 15s.

*The River Tyne Port Sanitary Authority.*—This was constituted by the Local Government Board's provisional order, confirmed by Act of Parliament, 45 & 46 Vict. c. lxiv., and is controlled by a Board composed of thirteen members elected by the corporations of Newcastle, Gateshead, Tynemouth, South Shields, and Jarrow, with one representative, respectively, of local boards on the north and south bank of the River Tyne. Dr. Henry Armstrong is medical officer of health to this authority as well as to the city of Newcastle. A vigilant watch was kept upon ships coming from foreign ports, known to be infected with cholera, fever, or small-pox; 172 vessels from infected or suspected ports being boarded and inspected. But this figure conveys only a very inadequate idea

of the amount of work done, for the number of vessels inspected amounted in all to 11,533; in respect of some of these, extra visits were also paid by Inspector Taylor and his assistants. The sanitary condition of these vessels is described as follows:—Good, 9,513; passable, 1,209; defective, 811. The notices served or orders given to abate nuisances or remedy various sanitary defects were 831; all these requirements were complied with except in the case of a small number of vessels which left port before they could be re-visited. But, even in such instances, the offenders do not wholly escape; note is taken of them, and if the vessels again visit the port, they are especially looked after, while if they are bound for British ports, the sanitary authorities there receive a notification of the facts.

A new pontoon hospital for infectious disease has been provided; and a new disinfecting apparatus has been fixed upon its deck, so that efficient disinfection may be carried out by means of sulphur, mixed with charcoal, and burnt in the apparatus in a suitable receptacle.

*Hanley, Staffordshire.*—The population of the County Borough of Hanley was 54,846 on April 5th, 1891; 25,581 residing in the Hanley district, and 29,328 in Shelton. Dr. John Clare, the medical officer of health, advocates what has been repeatedly recommended in the columns of *HYGIENE*, a quinquennial census, which would do much to obviate the numerous errors made all over the country, in calculating the rates of mortality, births, &c., arising through the discrepancies existing between the estimated and actual populations of localities. In the Hanley County Borough, for instance, according to the estimated increase, the population was supposed to be 58,617, instead of standing at the lower figure evidenced by the decennial census taken in 1891. From 1871 to 1881 the increase of population was at the rate of 21 per cent.; in the following decade it was only 13·5 per cent. It is needless for us to

dwell upon the errors which this circumstance would necessarily give rise to.

The birth-rate of the borough was 39·1 per 1,000, and the death-rate was 22·3 per 1,000, being 0·2 per 1,000 below the mean rate which was recorded in the 28 largest English towns, viz., 22·5. But the zymotic rate was 2·5, as against 2·4 in the 28 large towns, while the infant mortality (*i.e.*, deaths under one year of age) was 189 per 1,000 births, as compared with the average of 167 in the 28 large towns. As Dr. Clare observes, such an excessive rate of infant mortality can only mean ignorance or neglect, and he attributes it in part to the number of mothers who go to work, and leave their children to be hand-fed. Both the zymotic and infantile mortality were higher in the Hanley than in the Shelton district, thus following the ratio of the density of population, which is 42 living persons per acre in the former, and 24 only in the latter locality, and affording an unmistakable object lesson on the importance of keeping down overcrowding and preserving open spaces in towns.

While on the subject of zymotic diseases, we may mention that out of 139 deaths registered from these affections, 95 were attributed to measles, a very serious epidemic of which prevailed for several months. It was not until the sanitary authorities had adopted most extensive precautions that the disease was got within limits. One outcome of the outbreak was that the Sanitary Committee found it expedient to request the medical practitioners of the town to temporarily include measles in their notifications in order that isolation and disinfection might be properly resorted to; and that notification was found to be so desirable that it has been continued. The value of notification was also markedly exemplified with regard to scarlet fever. In the month of January, 31 cases were notified by local medical men, and in the following month 30 more cases. Prompt measures were taken, notices issued to school managers, isolation or removal enforced;



only eight deaths occurred out of the 205 cases of scarlet fever that were notified, and only one out of the 117 patients who were removed to the hospital for infectious diseases. "The fact that patients suffering from scarlet fever were removed, if they could not be sufficiently isolated, had," says Dr. Clare, "a two-fold good effect. It not only acted directly by preventing the contagion from spreading, but it also taught the parents, and others having charge of children, that scarlet fever was a serious disorder, and make them more careful to guard against the danger of infection."

Only one-third of the houses in Hanley Borough have any form of water closets connected with the main sewers; of the rest, some 4,000 have cesspool privies, and 3,500 are provided with Rochdale pans.

The water supply of Hanley and the neighbourhood, including considerable portions of Burslem and Newcastle-under-Lyne, is procured from the Staffordshire Waterworks Company; the water is obtained from the new red sandstone, by pumping from natural springs and wells situated at Wall Grange, about eight miles from Hanley, and entirely in a country district. It is not stored in large reservoirs, but is pumped continuously from day to day to a service reservoir, whence there is a constant supply to Hanley and the adjacent district.

In the Public Analyst's Department 101 samples were purchased for analysis under the Sale of Food and Drugs Act. These were 27 of milk, 15 of whiskey, 11 of pepper, 6 each of butter, bread, spirit of sweet nitre, cream of tartar, 7 of vinegar, 5 of yeast, 3 each of lard, precipitated sulphur, and chicory, 2 of tea, and 1 of flour. Only 4 samples were found to be adulterated—namely, 2 of milk, 1 of yeast, and 1 spirit of sweet nitre; convictions of the vendors were obtained in each case of adulteration.

## Reviews and Notices of Books.

*New Vegetarian Dishes.* By Mrs. Bowdich. 120 pages. London: George Bell and Sons. 1892.

THE preface to this book is written by Mr. Ernest Bell, the treasurer of the London Vegetarian Society. He strongly endorses the opinion we have more than once expressed in these columns, namely, that no really good vegetarian cookery-book existed. We speak in the past tense, because Mr. Bell, who is entitled to give his views as an expert, is so much in favour of this neat little volume, with its green cover, fancifully adorned with a sketch of peas in flower and pod, that we may conclude that he is satisfied that the desideratum has been supplied. Not that we can, or ought to, expect a Brillat-Savarin, or even a Soyer, in the author of a book on vegetarian cooking. Indeed, Mr. Bell implies as much, for he avows that a thorough-going vegetarian is by nature a man of such frugal habits and simple tastes that he needs but little cookery. Yet, surely, if we prefer to boil our peas, as one of the two pilgrims did to his great content and ease in travelling on a certain pilgrimage, there cannot be much harm in that; and if we add a small pat of fresh butter when they are ready for the table, and pepper and salt to tickle the palate, we ought not to be considered the less vegetarians on that account.

There is one part of Mr. Bell's preface which would have been better omitted—the allusions to "our carnivorous friends." The book will, we hope, find its way into the hands of many readers who are not vegetarians, and such remarks, while they do no good, may do harm, and deter persons from giving the book the attention it deserves. Total abstainers sometimes make, to our mind, the great mistake of regarding the moderate drinkers as worse than irreclaim-

able drunkards. For similar reasons, if this book is to convert moderate flesh-eaters to vegetarianism, it is scarcely judicious to brand them as "carnivorous," to rank them in thought and in theory with the tiger, the wolf, and the hyena; scarcely judicious, either, to be so assertive that flesh-eating promotes ferocity of mind and debases the moral qualities.

We cordially agree with Mr. Bell that what is required, as regards a vegetarian cookery-book, is one that will enable us to provide something that will take the place of meat, which, while nourishing, shall at the same time be palatable. This is what Mrs. Bowdich has aimed at, and she has succeeded admirably.

Out of the 221 recipes given, she claims that more than 200 are absolutely original, having been carefully planned and worked out by herself, and not previously published elsewhere.

We recommend all of our lady readers—of whom we are pleased to say we have a large number—to add Mrs. Bowdich's book to their collections of household guides.

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*Annali dell' Istituto d' Igiene Sperimentale.*—The last fasciculus, consisting of 128 pages of matter, illustrated with three chromo-lithographs and ten steel engravings, well sustains the high reputation of the department carried on in the University of Rome, under the superintendence of Professor Angelo Celli. It contains details of researches upon the physiological action of certain blue and violet colours derived from coal-tar, by Drs. Santori, Scalæ, and Jacoangeli, as well as of important bacteriological experiments conducted by Drs. Sanfelice and Doria.

*The Dietetic and Hygienic Gazette* (New York, U.S.A.) exhibits marked improvement in its modified condition. The number of this publication now lying on our table contains, amongst other interesting and instructive matter, an article on the "Successful Treatment of Chronic Diseases," by Dr. Simon Baruch, the editor of the *Gazette*, in which he advances a powerful plea for their methodical management, and an-

other by Dr. J. Boas, on the "Dietetics of Diseases of the Stomach."

*The Medical Magazine* (London: Southwood, Smith, and Co.) is a valuable addition to periodical medical literature, and its fifth monthly number is up to the mark of those previously issued. Well-edited, well-written, and well-printed, it should speedily obtain the hearty support of the profession. A monthly form is a more suitable one for the publication of solid, earnest contributions than a more frequent publication could be. Hygiene, we are pleased to note, is given a degree of prominence fitting to its importance, whether considered from a purely professional, or from a public, point of view.

Another new monthly magazine of good promise, which looks as if it had come to stay, is the *Modern Review*, dealing with a variety of social subjects, some of which scarcely find a place in ordinary periodicals. No. 2 (November) has ninety-six pages, devoted to such matters as the treatment and rescue of the poor little waifs and strays of our streets and courts, "The Marriage Mart of Modern Babylon" (by Lady Cook, better known as Miss Tennessee D. Claflin), and other subjects relating to the social position of women. The profession of medicine is represented by three papers, namely, on the "Curability of Cancer," the "Treatment of the Disease of Hypnotism," and the "Sanitary Condition of our Home Army." In the last-named, Dr. Birkbeck Nevins, a well-known opponent of the Contagious Diseases (commonly spoken of as the C.D.) Acts, cites figures and facts for the purpose of demonstrating that not only was the operation of these Acts in our garrison towns useless, but that the class of disorders which they were calculated to minimise actually increased amongst our soldiers and sailors after they had been introduced, and that, after the Acts had been totally repealed, the rise in disease was converted into a rapid fall.

*The Health Record* (Dublin) for November, has, as usual, a good deal of information interest-



ing to sanitarians and, indeed, to all who value good health as one of the greatest blessings of life.

## Notes and News.

"A GENTLEMAN'S HAT suits you," was the remark recently made to us by a friend when, on leaving his house, instead of putting on our customary soft, light felt hat, we jocularly donned his "chimney-pot," or "stove-pipe," as the Americans have sarcastically dubbed the black, shiny head-gear, measuring some six inches in height, and weighing some six ounces. We, of course, overlooked the innuendo, made before ladies, too, that, like the mermaid ceasing to be human in its lower portion, we ceased to present any semblance of the gentleman at our top storey. But on our walk homewards we could not help wondering what there could be about the hard hollow cylinder to make its wearers seem to be so excessively attached to that method of head-dress. Admitting that our changeable, often inclement, and still more frequently wet, climate necessitates some kind of covering for the head—notwithstanding the example of Blue Coat boys and butchers' apprentices—surely something more sensible than a "gentleman's hat" could be devised. Thousands, even hundreds of thousands, of men go about daily in that most uncomfortable, most awkward, and most unsightly style of head-covering, the "chimney-pot," not because they really like it—in their heart of hearts they hate it, and on every possible occasion they discard it—but because, at the prompting of fashion or folly, or both, it is "a gentleman's hat."

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TWENTY-FIVE MILLIONS OF POUNDS is a large sum of money, and represents, roundly speaking, two important items in our national expenditure; the first being the annual interest and other charges connected with the National Debt, the second being the total amount paid last year to foreigners for butter, eggs, cheese, poultry, vegetables, and fruit. Excluding the last-named, there is not a single item in this list which could not be produced on British soil, to the great benefit of the agricultural classes.

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THE NEW CEMETERY AT OXFORD, rendered necessary by the circumstance that the three previously existing cemeteries are full, has been so arranged that it will drain into a watercourse which discharges into the Thames. From what was stated at a recent meeting of the Oxford Town Council, and from the admissions of the engineer to the Council, the drainage of the other cemeteries is practically similar.

THE UNEQUAL DISTRIBUTION OF LAND is well shown by the following figures, for which the *Financial Reform Almanack* is our authority:—Two-thirds of the whole of the land of England and Wales belong to 10,207 individuals; 12 men claim one-fourth of Scotland, one of these being "lord and master" of 1,326,000 acres; while half of Ireland is owned by 744 persons.

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THE INFECTIOUS DISEASES NOTIFICATION ACT, as it at present stands, is open to one serious objection, and that is that, where no medical man has been called in, it is extremely difficult to enforce the Act against the parent, as it must be proved that the latter had a knowledge of his or her child's condition.

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TREES IN LONDON were, in our younger days, rare except in the parks and in the long-established squares; but the practice of planting trees alongside of the public roads is now becoming common, judging by the fact that a recent return shows the number of such trees in the metropolis to be nearly fifteen thousand.

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THE ELECTRIC INCANDESCENT LIGHT, properly shaded, is, according to Mr. Hartridge, surgeon to the Westminster Ophthalmic Hospital, superior to every other illuminator, and comes nearest to good and sufficient sunlight, which he takes as the standard of illumination best suited to the human eye.

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ITALY.—We learn from the Sanitary Office in Rome that, speaking generally, the public health of Italy is much better this year than last.

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SURGEON E. A. ROBERTS' PRIZE ESSAY ON SANITARY SCIENCE and Domestic Economy has been printed at the Government Press in Calcutta, and is now prescribed as a text-book for English and Anglo-vernacular schools throughout India. It is a thoroughly practical little treatise of 183 pages, treating of habitation, water, food, cleanliness, public health, nursing, the management of children, how to meet the emergencies of daily life, and numerous kindred matters, with special reference to the climate and general conditions of life in Hindostan.

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METROPOLITAN ASYLUMS BOARD.—At the meeting of this Board, on Saturday, it was reported that there were now fifteen small-pox patients in the hospitals, or an increase of thirteen on the previous fortnight. Nine of the cases came from one house at Islington. The scarlet fever returns showed that the epidemic is on the decline. There were now 4,257 fever patients in the hospitals, a decrease of 106 on the previous fortnight. The Chairman, Sir E. Galsworthy, in calling attention to the satisfactory nature of the returns, urged the Board to cleanse the hospitals during the winter, and prepare for a heavier year than the past.

# HYGIENE,

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## SPECIAL NOTICES.

**EDITORIAL.**—The Editor begs to express his thanks to numerous correspondents, and to state that he will be pleased to receive any communications and articles coming within the scope of *HYGIENE*.

**PUBLISHING.**—*Subscriptions* for 1893 are now due. *HYGIENE* will be sent for twelve months, post-free, on prepayment of 6s. only, to any address in Great Britain, Ireland, United States, Canada, France, Germany, Austria, Belgium, Netherlands, Italy, Spain, Portugal, Switzerland, Prussia, Denmark, Norway, Sweden, and other countries included in the Postal Union.

The *Title-page* and *Index* for 1892 (Vol. V.) are issued with the present number.

## SMOKE AND ITS PREVENTION.

THE MEANS AT OUR DISPOSAL FOR PREVENTING  
THE EMISSION OF SMOKE FROM FACTORIES AND  
DWELLING-HOUSES.

By ALFRED E. FLETCHER, F.I.C., F.C.S., H.M.'s  
Chief Inspector under the Alkali Works  
Regulation Act.

THE complaints that have been raised against the black smoke arising from the combustion of coal are not of yesterday. Nearly six centuries ago there was a cry in London that such a nuisance was not to be endured, and a royal

edict was issued by King Edward II., in the year 1316, that coal-burning should cease, and that if any self-willed citizen should continue the obnoxious practice and still contaminate the air with the foul vapour, his house should be pulled down about his ears.

This peremptory order for a time sufficed to stop the objectionable practice of burning smoky coal, but how long its effect lasted it is difficult to determine. It would appear that the increasing scarcity of wood, and the excellency of coal as a fuel, forced the latter again into use in spite of King and Commons, for, in later times, we find Parliament petitioning the King to stop the burning of coal, which had again come into use. Smoke, however, seems to have held its own in spite of all attempts at repression, although fresh efforts were continually made in that direction.

In the year 1829 a Select Committee of the House of Commons was appointed to inquire into the effect of the smoke from factory chimneys on the public health; and, in 1843, another committee was appointed to consider "the means and expediency of preventing the nuisance of smoke." No definite result is recorded.

Ten years later a determined step was taken by Lord Palmerston, then Prime Minister. He introduced a Bill making it penal to allow black smoke to issue from any factory chimney within the metropolis, or from any steam-vessel plying on the Thames above London Bridge. The fines



imposed were heavy and cumulative. The Act is that of 1853 (16 & 17 Vict. c. 128).

In 1856 this was followed by an amending Act extending the prohibition of smoke to all steam-vessels plying below London Bridge as far as the Nore, and including bakehouses and certain factories which had been kept out of the former Act.

A marked benefit was at once felt from the operation of these Acts. Steamboats on the Thames had been accustomed to vomit out huge volumes of smoke wholly out of proportion to their size, and factory chimneys in the eastern districts of London had filled the air with blackness. Now, all was changed; these chimneys seemed to keep perpetual holiday, though, indeed, the fires beneath them were never brighter, while Old Father Thames passed on his way under clearer air, and the gardens at the Temple and elsewhere on his banks rejoiced in flowers and shrubs hitherto impossible in the smoke-laden atmosphere.

The air of London was relieved of nearly all the smoke of factory chimneys by the operation of these Acts; but the smoke from dwelling-houses remained. In the foggy weather of winter, the great evils arising from this latter source are so painfully brought to the knowledge of every Londoner that he is unconscious of the relief he has gained by the operation of Lord Palmerston's Factory Smoke Acts.

The black smoke which rises from a coal fire consists of the volatile matter which is given off under the influence of heat, and yet has escaped combustion. When combustion is complete no visible smoke is discharged; the escaping gas consists then only of carbonic acid and vapour of water or steam, together with some sulphurous acid resulting from the burning of the sulphur pyrites in the coal.

Visible smoke is the result of an imperfect combustion. The gaseous matter set free when coal is heated consists of various compounds of hydrogen and carbon; when these are burned with a quantity of air insufficient to inflame the

whole, the hydrogen only is burnt, while the carbon remains in the form of the black matter or soot with which we are too familiar. This black residue is made apparent also when the combustion is rendered incomplete by deficiency of heat, even if there is a sufficiency of air or oxygen, as may be shown by introducing a piece of stout copper wire into the flame of a clear-burning wax candle; the cold wire diminishes the temperature of the flame, and, rendering the combustion incomplete, causes the formation of soot, part of which is deposited on the cold wire, and part rises in smoke from the top of the flame. Or, again, combustion may be rendered incomplete if sufficient time be not allowed for the due mixing of the combustible gas with the air. There must be intimate mixture, so as to promote contact between the air and every particle of the gas to be burned.

There are, then, three conditions to be observed in order to effect the complete combustion of the gaseous mixture given off from strongly-heated coal. First, there must be sufficient air; second, the air must be mixed with the gas; third, this mixture must be raised to the temperature of ignition.

It may be necessary to dwell briefly on this last head, and to observe that the temperature of ignition varies with different substances. The temperature at which sulphur ignites is much below that at which carbon will burn. Pure hydrogen, also, will ignite at a lower temperature than is necessary for hydro-carbons. These and the other gases which form the mixture given off on heating a bituminous coal require a heat approaching that of whiteness to ignite them.

Now, if these three conditions for the combustion of coal gas be all observed, the burning will be effected; but if the observance of any one of them be omitted, complete ignition will not take place.

It may be said that, in most furnace fires, the first condition is fulfilled, except at the time when fresh fuel is put on. When a bituminous coal is thrown upon a hot fire, a large volume of

gas is suddenly generated ; this fills for a time the draught passages, so that, just when an increased supply of air is needed, less air than usual finds access to the fire.

A very common cause of failure arises from a non-observance of the second condition necessary to complete combustion. The air, though admitted above and below the fire, never mixes with the gases thrown off from it, but passes with them in parallel streams till they reach a place where the temperature is so low that ignition is no longer possible.

In the furnaces of steam boilers, a very common cause of failure in combustion is the non-observance of the third condition. The gases rising from the fire, and mixed, perhaps, with the air needed for burning them, are, in many cases, hurried from the immediate neighbourhood of the fire, where alone a sufficiently high temperature is found, to the boiler flues, where, deprived of their heat, all combustion is impossible. This is especially the case in the so-called haystack-boiler, often used on river steamboats, and very commonly on the Clyde. In this kind of boiler, the fuel gases rising from the fire are at once led through cold tubes surrounded by water. In such a case, combustion, if commenced, is stopped and rendered impossible from want of heat, and the unburnt gases, laden with soot, pass on to the chimney.

Of the fuel used in manufacturing operations, about two-thirds are employed for raising steam. It is necessary, therefore, in considering the problem of smoke-prevention, to direct special attention to the construction of the furnaces of steam boilers. The three conditions already shown to be essential to complete combustion must be observed, and, beyond these, it is necessary to avoid, as far as possible, the admission of an excess of air, if the maximum duty of the fuel is to be realised.

When a furnace is fed by hand, the operations of stoking must necessarily be intermittent, and, consequently, the due proportion between the fuel and the air cannot be constantly maintained.

The necessity, also, of opening the fire-door is a constant source of loss, in that an excess of cold air is drawn in, which tends to cool the boiler. There is evidently, then, a danger, on the one hand, of supplying too little air, and so causing the formation of black smoke ; or, on the other hand, of supplying too much, and so causing a loss of heat.

In order to ascertain the general composition of fuel gases passing as smoke up factory chimneys I made a series of experiments in 1888, analysing the gases from furnaces in Newcastle and in Lancashire, where different kinds of coals were used.\* In all cases but one there was a very large excess of air, even when black smoke was emitted. The exception was where gaseous fuel was used ; here the balance was very nearly maintained, neither oxygen nor combustible gas being in excess.

In order to avoid the evils inherent to hand-stoking, to render the supply of coal more constant, and to keep the fire in a more uniform condition, many mechanical appliances have been adopted. In some of these the coal is continually thrown or sprinkled on the fire in small quantities, in others it is pushed in at the front and worked back by movements of the bars till the clinkers are discharged under the bridge. Many patents have been taken out for the various modifications of these machines, and for methods of conducting the combustion of coal in furnaces economically without the production of smoke. Some of these appliances are expensive to erect, and some have proved very expensive in use, the cost of maintenance being excessive, while some, on the other hand, effect a saving of labour and of fuel.

One method now largely employed for effecting the complete combustion of fuel, and for preventing the discharge of black smoke, is that of converting the coal into gas and employing it

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\* A detailed table of these experiments (fifty-two in number) is published in the "Transactions of the Seventh International Congress of Hygiene," vol. v., pp. 31 to 34.



in the furnace in place of solid fuel. This is done by burning the coal in a gas-producer. A limited portion of air only is admitted, so that the fuel is carried off as a gas consisting of a mixture of carbon monoxide and hydrocarbons. If steam is admitted, it is decomposed by the incandescent carbon. In this operation of gas production about one-third of the heat of the fuel is lost at the producer, and, unless some corresponding advantage sufficient to compensate for this expenditure can be gained, the process is not economical. In many cases, convenience of application and the opportunity of saving in regenerators some of the heat justify the initial loss; in great measure it may also be recouped by so treating the gas as to separate the tar and ammonia formed in its generation. Where this is done, or where in any other way the employment of gas can be made economical, its use as a fuel is greatly to be desired as a means of preventing the emission of black smoke. Its use is particularly to be recommended in furnace fires, where a reducing atmosphere is needed, as in iron-heating furnaces. In such cases the gas may be made largely to consist of carbon monoxide and hydrogen; these, being kept in excess of the air supplied for combustion, will afford a reducing atmosphere in the furnace, and will burn, as it escapes either through the door or the chimney, with a smokeless flame.

It may be confidently asserted that by the observance of the principles here laid down, and by the adoption of appliances now in frequent use, the economical use of bituminous coal as a fuel may be conducted without the discharge of black smoke.

*House Smoke.*—Thus far, attention has been drawn to the prevention of black smoke from manufacturing operations. In many of our densely-peopled cities, however, the house chimneys contribute more to the pollution of the air than do those of factory furnaces.

Many attempts have been made by introducing close stoves, or modifications of our fire-grates, to prevent the emission of smoke;

but our preference for the open fire, in which a flaming coal is burnt, is so determined that it would seem that smoke is inevitable. Sir Douglas Galton has done good service by devising a form of open grate, in which a supply of air is so introduced as to assist greatly in the combustion of the smoke that would otherwise have escaped. Still there *is* smoke, and that, coming as it does from thousands of chimneys, forms a mighty cloud and an enormous pollution of the atmosphere. One further suggestion may, however, perhaps be made, for, at any rate, largely diminishing this discharge of smoke, while still retaining the open fire.

Let a hot-air stove, burning coke or anthracite, be placed in the basement of the house, and a copious supply of warm, but not over-heated, air be thrown into the passages and rooms. This has the effect of adding so much to the general comfort of the house that the demand on the separate fires is greatly diminished, less coal is burnt in them, and less smoke is therefore given off. The air, before coming to the hot-air stove to be warmed, should be led through a large filter-sheet of cotton wool or other fibrous matter, to collect the dust and smut. It is then not likely to convey the burnt or charred smell which arises from the scorching of the small pieces of fibre and organic matter generally to be found floating in it. As every chimney from the open fires is carrying up a large quantity of air, this air must be supplied to the house through some channel. Usually this is done by the leakages at windows or doors, causing unpleasant draughts; or at night, when the house is closely shut, this supply of air enters down the unused chimneys, bringing the damp and cold air from outside into the bedrooms, and with it a strong and most unwholesome smell of soot. All these evils are avoided by the admission of a copious stream of warm filtered air into the house through a channel properly provided for it.

The use of gas as a smokeless fuel is largely to be recommended as a means of diminishing the production of smoke; its employment for

cooking, heating of water for baths, &c., cannot be too strongly advocated, and also its largely extended use for heating our rooms, while the general warmth of the house is maintained by a centrally placed hot-air stove.

A supply of cheap gas, and its liberal use as fuel in dwelling-houses, together with the adoption of coke-fed hot-air stoves in the basement of houses will, I think, be found the most effectual cure for the great plague of town smoke. Where this system is adopted, the present open fires, to which we are so much attached, may remain, but their use will be greatly diminished, while our comfort both in and out of our houses will be largely increased. Seeing that by this system the carrying of coals about the house, the removal of ashes, and the daily cleaning of fire-grates would be much lessened, the use of gas as a fuel can be recommended for its economy as well as for its cleanliness.

## **DRAINAGE AND IRRIGATION OF LAND IN THEIR RELATIONS TO HEALTH.**

By RICHARD F. GRANTHAM, M.I.C.E.

At the Brighton Congress of the Sanitary Institute, Sir Thomas Crawford, in his presidential address, remarked: "Putting aside the West Coast of Africa and other pestilential spots especially dangerous to life, we may confidently say there is not a part of the globe where men may not be kept in health and vigour by proper attention to hygiene."

It is obvious that the possibility of rendering nearly all lands salubrious, as suggested by this remark, would be largely due to the agency of drainage in one form or another. We have heard much of late years of the drainage of towns and houses, and of its beneficial effects upon the public health; but the subjects of drainage and irrigation of land in their relations to the health of the inhabitants of the country have not been as much discussed.

It has been shown that decaying vegetable or animal matter under a hot sun in damp soils, swamps, or swampy, stagnant pools, however small, is capable of generating the poison of malaria in sufficient quantity to infect those who inhale it, and to cause fever, which is often mistaken for typhoid. Malaria has been defined as air or a mixture of air or any gaseous medium impregnated with miasma—*i.e.*, fine floating particles of poisonous matter exhaled from putrifying vegetable or animal substances—and it produces ague, rheumatism, neuralgia, and intermittent fever in persons who dwell in localities where the poison is generated. In the spring of 1879, Signor Tommassi, of Rome, and Professor Klebs, of Prague, who made the subject one of special investigation in the notorious Agio Romano, attempted to discover the physical cause or poison to which marsh or intermittent fevers are due. They allege that the fevers arise from germs present in the soil and floating in the air, and they claim to have traced the particular bacillus which is the cause of the evil. It is related that at Versailles a sudden outbreak of ague in a regiment of cavalry was traced to the use of surface water taken from a marshy district, and it is likely that in fenny districts more harm has arisen from drinking marsh water than from breathing the air.

There are two sources of malaria from marshes—*viz.*, living and dead plants; and when stagnant water contains more vegetable matter than it can oxidise by means of the absorbed air, then some injurious exhalation from the unoxidised vegetable matter is given off.

The testimony of persons who have lived in the fens shows that when land is completely covered with water, or when marshes have been completely drained, there is not the prevalence of aguish complaints which occurs immediately after the water level has been lowered by drainage works, and before the effect of these in thoroughly drying the ground has been felt.

Intermittent fever has also been attributed



in tropical climates to the turning up of soil long undisturbed, and Sir Douglas Galton mentions cases at Hong Kong and in the South of France where fever broke out amongst soldiers and labourers after the excavation of foundations for barracks. Much attention has been given to the subject of this particular fever by the State Board of Health of Massachusetts. In the annual report for 1889 there is an account of inquiries made into its occurrence in various towns of the State. It would seem, according to the report of the medical officer, that returns were received from 152 cities and towns; that in 86 of these the fever occurred, and in 64 of the 86 the cases occurred near pools, lakes, reservoirs, streams, marshes, flooded lands, upturned soil, and localities more or less infiltrated with sewage. He points out, however, that these conditions are factors only in the outbreaks of the disease, and not the cause, for otherwise the exemption of other towns similarly situated could not be accounted for. The report concludes with the following suggestive remarks:—"Grant that it is a truth generally accepted that the introduction of a germ is necessary; grant, also, that water is almost certain to prove to be the germ's habitat and the vehicle by which this microbe enters the human organisation; yet we have not explained why and how it omits certain localities and appears in others. This much, however, is true, that the appearance and spread of intermittent fever in Massachusetts afford an opportunity for investigation which, so far as is known to the writer, has never been systematically undertaken."

In portions of the North-West Provinces of India excessive fever mortality has been mitigated by extensive drainage works, by means of which the water which formerly stagnated in the land is now carried away by continuously flowing streams. In describing the lagoons in Corsica, the late Dr. Ansted pointed out how the total stagnation and high temperature of so large a sheet of very shallow water produce a

rapid growth of confervoid vegetation on the water. This vegetation drifts in enormous masses to the inner shore, where it accumulates and rots. The smell and miasma are carried up the valleys by the prevalent south-easterly winds, and so poison not only the plains adjacent to the lagoons, but the greater part of the eastern side of the island. In all the valleys the villages are unhealthy, and the town of Bastia itself suffers severely; the death-rate of Bastia being 22 per 1,000, while that of the communes north of Bastia, and so out of reach of the miasma, is only from 16·75 to 18 per 1,000. In a Parliamentary report on the reasons of the reduced mortality in the French army serving in Algeria, Colonel Ewart and Dr. Sutherland state that a reduction of the water-level 20 inches below the level it formerly occupied in a certain district of Algeria had been followed by a reduction of the annual death-rate from 57 per 1,000 to 24·8, and would to a rate even lower still.

Much evidence, both in England and America, has been accumulated to prove that consumption is produced by dampness of site, and that in towns where, through sanitary improvements the soil has become dry, it has diminished. Dr. Farr held that on the undrained lands of the lower valleys of the Thames, and of other English rivers, where their waters are sluggish and thrown out of their channels by milldams, thousands of the population suffer from ague, rheumatism, and neuralgia, while many die of these diseases and complications. Drainage of the marsh lands, removal of obstructions to the rivers, and engineering improvements of the water channels would obliterate countless evils.

Mr. R. B. Grantham, in reporting to the Inclosure (now the Land) Commissioners, upon the floods of Somersetshire, stated as the result of his inquiries among medical men, that during the wet weather of the winter 1871-72, the public health was good, but that ague set in early in the spring, and was then very prevalent on the verges of the moors, not only among

the poorer families, but also among people in a better class of life. Neuralgia and rheumatism prevail at all times of the year in these districts. Upon the floods retiring, ague is the most common, but typhoid and other fevers are rarely to be met with, although with an increase of heat and the great length of time that the waters remained on the land, exposing a large amount of decaying vegetation, intermittent fevers do occur on the moors.

In my own experience, in Kent and Essex, I have found ague prevalent in the marshes of the Hundred of Hoo, in the former county, one of my own workmen having been attacked by it; while in Canvey Island, with which I am particularly acquainted, where the surface is from five to six feet below the high tides, ague is now unknown. Camden, in his "Britannia" (A.D. 1607), refers, however, to the river having passed through "low and unhealthy" grounds in the island of Canvey. The river walls are now in good condition, and the drainage well maintained, and the present healthiness of the population is no doubt due to the efficiency of these works.

Mr. H. Marten, in his presidential address to the engineering section of the Congress held at Worcester, in 1889, stated his opinion that the lowering of the line of saturation, or, in other words, the lowering of the underground water level, effected by improvements in the drainage of the fens, has a most important bearing on their sanitary condition.

Proceeding now to inquire into the effects of irrigation, I must refer to other countries—viz., Italy and India—for systems on a large scale.

It is claimed for India that she possesses the finest irrigation works in the world. They extend over an area of about 8,000,000 acres, an area considerably larger than the whole of Lombardy, or the surface under irrigation in Egypt. These works have unquestionably conferred immense benefits upon the soil, the climate, and the welfare of the people, in preserving them from the

effects of drought, but at the same time they have produced serious insanitary conditions.

Colonel Baird Smith, in his work on "Italian Irrigation," makes frequent reference to the unhealthiness and depopulation caused by malarious influences. Three kinds of irrigation have been practised in Italy for three different states of cultivation—the ordinary periodical flooding; marcite, or winter flooding, when the land is under flood for a certain period; and irrigation for rice cultivation. The first was carried on without prejudice to health, inasmuch as the water simply flowed over the land and passed off; the second was practised during the winter when the temperature was low, and the evaporation small, while the water completely covered the land so that no harm ensued; but the third, that used for rice cultivation, was held to be so injurious to health, owing to the stagnation of the water upon the fields, that laws were passed restricting the limits of such cultivation to three or four miles from the outskirts of any town.

(To be continued.)

## THE DORSET LABOURER AND HIS SURROUNDINGS.

By Dr. A. J. H. CRESPI (Wimborne), late Editor of the *Sanitary Review*.

THE Dorset labourer's condition has long been considered deplorable, and for this there was some excuse; and yet, though his condition is often talked about, it is little studied, and is, in spite of the strong light thrown upon it, perhaps still only imperfectly understood. His low wages, hard work, and rural seclusion have been the text of many a speech and article; but most of the efforts on his behalf are marred by a singular ignorance of the district and the man. I shall attempt to describe him and his surroundings as they really are.

South-East Dorset, which, as it has a distinct



character of its own, will be enough for this article, is that part of the county surrounding the pretty and rapidly-increasing town of Wimborne, and reaching Bournemouth eight miles south-east. It is a highly-favoured region, and most beautiful. It is richly-wooded, and contains some of the most lovely parks in the kingdom. Many fertile and well-cultivated farms, and occasional pretty villages, are interspersed among vast heaths. The roads are capital, while the climate is one of exceptional pleasantness, damp, but mild and bright in autumn; and warm, sunny, and exceedingly dry in spring and summer. The district abounds in fruit, flowers, and vegetables. It escapes the constant damp of Devon and Cornwall, and the gloom and fogs of London and the inland counties and great towns. It certainly lacks the incomparable park-like scenery of the Derbyshire dales, and the glorious fertility and loveliness of the country between Hereford and Brecon on the one hand, and Devynock on the other; but, taking it as a whole, it is a pleasant land, with a low death-rate, little sickness, and many advantages from its proximity to the important railway station at Wimborne and the thickly-populated districts round Bournemouth, where the demand for servants and workpeople, as well as for fruit, vegetables, and farm produce are constantly increasing. The great estates of Lord Portman, Lord Alington, Lord Wimborne, and the Earl of Shaftesbury, the smaller ones of the Marquis of Salisbury, Mr. Bankes, Sir John Hanham, and Sir Richard Glyn, add to the charms of the district. Some of these landowners, in addition to repeated acts of public munificence, such as building and enlarging churches, giving public parks, and endowing and supporting hospitals and local charities, give ungrudgingly and untiringly to the peasantry needing help. Indeed, some of the local nobility are generous beyond all praise, and their not always inexhaustible resources are drawn upon as great employers of labour will not permit theirs to be.

On the manors a very large number of men are employed at good wages. On the estates, more particularly of Lord Alington and Lord Wimborne, the villages of Witchampton, Crichel, and Canford are conspicuous for their beauty, for the excellence of the cottage accommodation, and the low rents. Cottages carrying with them large and productive gardens can be got at a shilling a week, or three pounds a year. A very little inquiry convinces any impartial visitor or resident that, when allowance is made for falling rents, shrinking incomes, and the comparative abundance of rural labour, the landholders show a consideration and humanity beyond all praise, and far greater than the severe requirements of political economy demand. When it is remembered that throughout the district a shoeless child or a partially unclothed adult is never seen unless it be some tramp from a distance; when the vile back streets of Liverpool, the filthy hovels of Birmingham slums, and the numbers of barefooted children in Cardiff are remembered, the conclusion must be drawn that the Dorset labourer is not the degraded and poverty-stricken creature often supposed. Of course, the villages of Crichel, Witchampton, and Canford must not be taken as representing all cottages and villages in the district. There are differences in the villages, and there are occasional dissipated and profligate men and women dead to shame and reproof. There is no superfluity of wealth, no superabundance of employment, no high wages; but there is much solid comfort, and, for men fond of the country, content not to have many facilities for rising in the world, and sufficiently industrious to cultivate their gardens and allotments, I can imagine many less desirable districts and far greater hardships.

Strenuous efforts have been made of late to raise the agricultural labourer, and spur him on—to a malignant hatred of his employers some people say; others call it a noble discontent with the hardships of his lot. As far as these efforts are in harmony with justice and religion they deserve honour; and when, as may occasionally

be the case, they go too far, and seem likely to separate classes, a thoughtful critic will make allowance for the heat of public speeches and the unguarded utterances of men not trained to balance words like a Lord Justice of Appeal delivering a judgment. It is a good sign of the times that the Dorset labourer, who, I must observe, is far removed from being the coarse boor he is commonly reported to be, is particularly anxious to rise in the world and improve his condition. As a broad rule, the Dorset labourer is a tall, or at least well-grown, robust man, often combining singular refinement of manner with great natural shrewdness, full of self-respect, proud of successful efforts on his part to get on in the world, and expressing himself admirably. Some of the men and women in the remoter districts still use that interesting old Dorset dialect on which Mr. Barnes and, in less degree, Professor Max Müller have thrown much light. I have seen Dorset labourers who, well dressed and in a drawing-room, would not look so much out of place as one would expect, and many a rich merchant has little of the natural grace of manner and careless, easy air of good breeding to be found here and there in lonely woodland cottages and moorland villages.

When I remember the straitened means of the labourers, the seclusion of their lives, and their small advantages; when I look at their exquisitely clean and pretty cottages, and at the tasteful and neat dresses of their children, I am disposed to take off my hat as I pass them, and do them honour for their admirable management and praiseworthy thrift. Indeed, I should not hesitate to maintain that they are often a model to their social superiors in temperance, honesty, and uncomplaining trust in God. The occasional appearance of a veritable boor, or a glance through the open door of some dirty, neglected cottage, or the passing of an hereditary pauper or drunken scapegrace along the road, do not materially modify what I have said. The Dorset labourer is not without many serious

drawbacks. Wages are, taking them as a whole, low. Only their short hours of work and the indomitable energy and thrift of the men enable them to live in anything like comfort and independence. In many cases, early and late, before seven in the morning and after five at night, they devote themselves to their own garden, which keeps them supplied with a large stock of vegetables that in some measure supplements their slender money resources, and enables them to preserve their independence. I have often been touched by the honest pride with which some of these poor people refuse parish help. Some tell you that they have never had a penny from the parish and not a penny from charity, and that they do not owe a farthing to anyone.

The headquarters of the Labourers' Union are Wimborne and Hinton Martel, the latter a pretty and thriving village five miles from the former. The agitation has undoubtedly been in some measure carried on as a political one, and it may be that the speakers have often thought more of making converts to Radicalism than of discussing practical schemes for the labourer's good. In its early days some of the clergy took part in the agitation; but of late, as it has become more distinctly political, they have withdrawn from it, and in some degree this is to be deplored, as their presence checked extreme violence, although I am afraid that it is not doing the clergy injustice to say that they have still much to learn in getting the confidence of the working classes and guiding them for their higher good. The clergy are rarely in touch with the working classes, and seldom understand them as they ought and might.

As long as agriculture is depressed, farmers despondent, rents falling, and prices low; as long as labourers marry early and have large families; as long as improved and more productive methods of agriculture are not more generally introduced, or are from any cause impracticable, I cannot see that there can be greater abundance



and constancy of employment; or a rise in wages; and, unfortunately, the too general tendency is to lower wages and more precarious work.

Although there is comparatively little overcrowding, and the supply of new cottages has been considerable, more particularly at Wimborne, there is still a demand for more cheap cottages in that town, as well as in many villages near it; and in exceptional cases the cottage accommodation is inferior in quality and insufficient in quantity. But we can hardly expect the landowners to do much, and builders know how unremunerative such investments are, so that they cannot be blamed for not keeping pace with the increasing demand. There are remedies. Many villages do not possess one single resident representative of the upper and wealthier classes. For example, in the extensive parishes of Holt, Stanbridge, Hinton, Chalbury, Horton, Woodlands, and Verwood—seven adjoining parishes—there are only six clerical representatives of the middle classes, a score or so of farmers, and two, or at most, three, families belonging to what are conventionally, but not always accurately, described as the upper classes. Not a doctor, lawyer, officer, or retired business man is to be found in the seven. Is it not obvious that a couple of well-to-do families in each parish would be a distinct gain? And in spite of some of the manifold disadvantages of country life, many of the middle-class families, which swarm in our fashionable towns and at the West End, and are lost in the crowd, would gain in dignity, health, and position by settling in a lovely country parish where they could have large gardens and ample opportunities for outdoor amusements. How much they could do at small cost to themselves to help their poorer neighbours and employ them! Again, I have spoken of the vast tracts of barren heath found in most Dorset parishes. Much of this is at present absolutely unproductive, and at first sight looks unfit for cultivation. But there are in the district rich and fertile fields, productive gardens and cultivated plots, that have recently been

enclosed out of the dry and dusty heath. Small farms have been brought into cultivation in the past ten years that now present a beautiful picture; parts of them are covered with splendid field cabbages, weighing 26 lb., 32 lb., and even 37 lb. apiece. The patient, self-sacrificing energy of hundreds of Dorset labourers would, in a few years, transform thousands of acres of worthless heath into a garden. It could not be done by the landlords or the farmers, not, at any rate, profitably, but the labourer would do it and glory in it. Were the larger landowners to try the experiment on an extensive scale—building, for instance, a score of semi-detached cottages, at, say, £250 a pair, in one place, and somewhere else a dozen or so, charging a fair rent for the cottages, but allotting to them for a dozen or fourteen years a couple of acres apiece of heath, rent free, success would be certain. It is hard to ask an overtaxed landlord to spend two or three thousand pounds in such a way, but in the long run it would pay, and the value of the estate would be increased. The Dorset labourer is no Socialist, no irreconcilable, revolutionary firebrand; he is honest, hard-working, and self-respecting, and anxious for honest independence and eager to get land to till.

But his earth-hunger is great, and few attempts have been made to satisfy it. Every time he goes out he sees thousands of acres of unoccupied land, of which he cannot get a quarter of an acre to fill up his spare time, his anger is kindled, and he is ready to support any wild proposal for land nationalisation. The many apathetic and unsympathetic opponents of reform are sitting on a bottled-up volcano, and some day, when they least expect it, a terrible explosion will startle them.

Give him land, and he will work from morn till night, amply repaid by the delight of possession, and the consciousness of independence. The most conservative of landowners could hardly devise any measure more truly conservative than giving his poor neighbours the chance

of rising in the world. It makes the heart bleed to see industrious men longing, yearning, clamouring for two or three acres of heath, and all around them vast tracts of unbroken land that would tax the energies of three times the population to cultivate, and, at the same time, no effort on a large scale being made to keep the agricultural labourer from migrating to the great towns, and inducing him to remain on the land which he loves so well and is so eager to cultivate.

Lady Verney, a most accomplished and philanthropic woman, whose long and minute study of peasant proprietors and properties entitles every word of hers to respectful attention, does not endorse my views regarding the prudence of giving labourers more land, but I am glad to find that she approves of letting them have good allotments. I do not advocate the creation of a vast body of small proprietors, certainly not by Act of Parliament (the economic conditions of England and the climate are fatal drawbacks), but I do want them to have larger allotments, and in some districts, where land is jealously tied up from them, greater facilities for renting land. Lord Nelson, whose kindness and benevolence are thoroughly appreciated in Dorset, Hants, and Wilts, has written—page 873 of the *Nineteenth Century* for 1885, Vol. XVIII.—a charming article on “Small Holdings”; nothing could be truer, fairer, and more liberal. The Earl speaks with authority and knowledge, and, being a large landowner, he knows better than I can pretend to do the outlay involved in such changes and improvements as he discusses and I favour.

At the same time, however, it must not be forgotten that all owners of land are not like the accomplished nephew of Nelson, nor can all labourers get that regular employment described by Lady Verney as within their reach. Labourers want land to cultivate in their leisure time, and only by an extension of allotments will they get full employment and be kept on the land.

## SCHOOL HYGIENE: PHYSICAL EXERCISES IN ELEMENTARY SCHOOLS.

By ALLAN BROMAN.

ATTENTION has lately been drawn to physical education in schools, and much has been said and written on this subject.\* Medical men and the general public began to take it up; schoolmasters, often resenting any reform in the standing *régime* of the school, have followed; and at the present day there is scarcely any other part of school hygiene which is so conspicuously brought forward as this. At the same time, I venture to say there is scarcely any that is less satisfactorily treated. Once the cry is raised of “exercise for the children,” any kind of exercise seems to be considered sufficient, the efficiency of such exercise not being taken into account at all. That such a course of proceeding is not justified by facts must be apparent to everyone who has studied the physiology of bodily exercises.

In offering the following remarks upon the physical education in English schools, it is necessary to point out the great difference that exists between the various educational institutions of this country.

In the universities and the large public schools the physical education of the students takes a prominent place. Well-fitted gymnasias, swimming-baths, and large fields for the systematic practice of sports and games afford opportunities for bodily exercises, of which the scholars avail themselves in the most spirited manner. No other country can be compared with England in this respect.

But in the elementary schools, to which I shall confine my remarks, the case is quite different. These schools leave a great deal to be desired in what concerns the physical education of the child. Here, for obvious reasons, regulated physical exercises—educational gym-

\* In connection with this subject, see article on “Physical Education,” by Mr. George White, B.A., LL.B., in *HYGIENE* for December, 1892.



nastics—must take the place of free, open-air games and sports.

Everybody who has studied child-life in its different phases knows that there is one thing which especially strikes the observer—namely, the incessant and irrepressible need of movement that every healthy child exhibits. The cause for this is to be sought in the natural laws according to which the whole development of the child takes place. Physiology teaches us that muscular exercise is absolutely necessary for the growth of the child, as necessary as food and air are to attain the development, physical and mental, that nature intended. Depriving the children of the opportunities for free movement is, therefore, a direct violation of nature's laws, and cannot be done without harm to their organisms.

When a child begins school, its conditions of life are at once considerably altered. From freedom it is brought under restraint; from the perpetual motion which its body requires, it is placed on the school bench and told to "keep still," an order which, as every teacher knows, is obeyed with great difficulty. This alone would be sufficient to impede and prevent the natural growth and development of the child. But on the forms bad positions are often taken and sustained for some time by the pupils. The injurious effects of forced inactivity are thus aggravated, and the result is, too often, deformities of various kinds. Hence it is that we see so many children afflicted with the common ailments, popularly called the poking chin, the stooping shoulders, the flat and narrow chest, generally combined with spinal curvatures of one form or another. It is interesting to note how all these defects directly attack the chest, just the parts of the body which, containing organs of such vital importance as the heart and lungs, ought to be particularly protected.

If we consider the cause of all these deformities, the remedy will be found near at hand; for it only stands to reason that if muscular inactivity and bad positions *can* cause and *do*

cause an evil, the contrary—physical exercises, consisting of rightly-chosen movements, carefully executed in good positions—will, if used in time, counteract the bad influences, and prevent the irregular development. And that such is the case has been abundantly proved by experience.

Therefore, although the studies in school compel the children to muscular inactivity for a certain time, which cannot be avoided, we must by suitable exercises prevent them from suffering harm physically; and it becomes an imperative duty in the management of the school to see that this is effectively done.

The aim of physical education is to promote a harmonious development of the body. Remembering the grave dangers we have just mentioned to the natural development of the child, consequent on school life, it is clear that these must first of all be averted. The exercises must therefore, in the first instance, be *corrective*—that is to say, directed towards widening of the chest, straightening of the spine, and a correct carriage of the head and shoulders. The greatest attention should be paid to their effect upon the respiratory and circulatory organs. To attain this, the muscles must be the *means*, not in themselves the *end*; for a muscular development is not always a sign of bodily health. If attention be paid to such developments mainly, harm is often done to vital parts. It is well known that heart and lung diseases are the professional ailments of acrobats and others who make violent gymnastics their aim in life.

A most important matter, though often neglected, is the *sequence* of movements in the lesson. When we reflect how every movement has its effect, local and general, upon the system, it is clear that the exercises must not follow each other anyhow, but with due regard paid to this effect. For instance, an exercise which has unduly increased the action of the heart and lungs must be followed by one which has a quieting influence upon the same organs.

It is often urged that the exercises should be

made a recreation for the children. This is true enough, although not in the sense in which it is generally spoken. For by "recreative" is, more often than not, meant "amusing" exercises; and to provide amusement is not the aim of physical education. But recreative, in a higher sense, bodily exercises, rightly executed, certainly are. For, by muscular activity the blood is drawn from central to peripheral parts of the system. Congestion to the brain and pelvis—caused by intellectual work combined with long sitting still on the school-benches—are thus relieved; and a reaction takes place, as beneficial to the mind as to the body.

Regarding the question of physical education from the *hygienic* point of view, there can scarcely be any doubt as to the place that should be allotted to the subject in the ordinary school routine. It cannot very well be compared with the other subjects taught in school. Its aim and the object of its introduction in the school work are different. Here the instruction does not mean preparing for an examination with questions and answers. It means rather the supplying of a want, the want of movement which nature requires for the healthy development of the children. What is the use of well-constructed forms and benches in the school, if the children are not able to carry their spines erect, and to avoid curvatures of different kinds? What is the use of airy, well-ventilated school-rooms, if the children have not got large enough lungs in their narrow chests to benefit from the fresh air? What is even the use of intellectual instruction, if the overtaxed brains of the children are not capable of digesting the mental food they get during school hours? Let, therefore, physical education take its place amongst and complete the hygienic arrangements of the school. If looked upon as part of the school hygiene much of the opposition and prejudices by which its progress is now hampered will vanish, and many misunderstandings regarding it will disappear. For it to be of any use, a proper amount of time must be given to it. That the lessons ought to

be of daily occurrence is only natural, since the defects in School-life, which they are intended to neutralise, are always at hand. It is an important question in itself, and worthy of earnest consideration. But less than half-an-hour each day cannot be proposed seriously, if the children are to derive real and lasting benefit from their work.

As has been already remarked, the subject is not yet arranged on a satisfactory basis in the elementary schools. Military drill or physical exercises are certainly taught in most of them, but the exercises lack strangely both in quantity and quality—in quantity, because the time allotted is insufficient; in quality, because the exercises are badly chosen. The reason for this is, no doubt, that the subject has been and is looked down upon; time and thought are unwillingly bestowed upon it.

The teachers—most excellent as instructors—are deficient, as a rule, of the theoretical knowledge necessary to choose and combine the movements to the greatest benefit of the children. Exercises are copied either from the acrobat's tricks or from military gymnasia. The latter are by far the best, but the teachers—often old soldiers—ignore that what is excellent for the development of muscle in a healthy full-grown man may be entirely unsatisfactory and even dangerous to a growing child.

In addition to these drawbacks comes the love of display, which has been carried to such an extent that often the real hygienic and educational object of the exercises is quite obscured. Movements are executed to music, and everything, either of form or usefulness, is sacrificed to the time of the piano or the rhythm of the song, as the case may be.

It is evident from these facts that reforms are required. Neither are signs of improvement wanting. In many schools throughout the country, especially girls' schools, physical education has been introduced in a rational manner. The School Board for London has for several years paid some attention to the subject, and with good results.



In most cases these improvements are based upon the so-called Swedish system of gymnastics, a system as yet very imperfectly known here, but well worthy of a thorough study. On the Continent, attention is now directed towards this system of physical exercises, and publications have appeared which treat of this branch of education, with special reference to its standing in Sweden; of these I may mention two. One is a pamphlet by Dr. E. Meyer, printed at Doberan, and bearing the title "Zur Körperlichen Erziehung der Jugend." The other is an article by Dr. Fernand Lagrange, well known for his previous work on the physiology of bodily exercises. It appeared in the April number, 1891, of the "Revue des deux Mondes," and is called "La Gymnastique à Stockholm." Both authors speak from personal knowledge of the subject, having spent some time at the Royal Gymnastic College in Stockholm, and recommend a study of the Swedish system on account of its thoroughness, scientific basis, and obvious good results upon the youths.

In England, with the Englishman's well-known love for bodily health and vigour working in its favour, there should be a bright future and rapid progress for physical education. But time and a distinct place in the school curriculum must be given to the subject. This, I think, would be best accomplished by insisting upon educational gymnastics being introduced as a part of school hygiene, to which the exercises, as pertaining to the healthy development of children, rightly belong.

A SURREY FARMER, who has, for the last two months, been engaged in establishing a dairy farm for the purpose of supplying milk and other dairy produce to London, told us, a few days back, that the rates of railway carriage of such articles would be increased by 20 per cent. on and after the first day of January. He is thus met with a serious obstacle at the very onset of his business. Yet his case is only one, and not so bad as that of, say, 100,000 farmers conducting agricultural operations in more distant parts of the Kingdom, who have hitherto found a market for their meat, corn, hay, and other farm-stuff in London.

## THE EXTENT TO WHICH THE STATE SHOULD EXERCISE CONTROL OVER THE SALE OF POISONS, IN THE INTERESTS OF PUBLIC HEALTH.\*

By G. DANFORD THOMAS, M.D., Coroner for London and Middlesex.

ON reference to the Report of the Registrar-General for 1889, I find that 15,025 persons died during the year from what are termed violent deaths, and that of this number 636 were from the effects of poison; excluding authentic cases of suicide, which number 260, there are left 376 cases of death arising from poison, classified as occurring from accident or negligence. The various poisons recorded as causing these deaths were arsenic, mercury, lead, copper, lunar caustic, ammonia, caustic soda, caustic potash, phosphorus, sulphuric acid, nitric acid, hydrochloric acid, carbolic acid, carbonic acid, turpentine, paraffin, opium, laudanum, morphia, cordial, soothing syrup, paregoric, chlorodyne, alcohol, chloral, atropine, belladonna, iodine, prussic acid, oil of almonds, cyanide of potassium, aconite, colchicum, strychnia, nux-vomica, cocaine, antipyrine, Steedman's powders, and Burnett's disinfectant; and besides these a few deaths were attributed to the eating of fungi, poisonous weeds, and poisonous fish.

The records of the coroner's court would reveal, in detail, exactly how and under what circumstances these deaths occurred, and how, when, and where, and in what form the particular poison causing each death was obtained and taken. Such records are well known to medical men, and, therefore, unnecessary to be repeated in detail here. Most of these poisons

\* In this paper, which was originally read at the International Congress of Hygiene, Dr. Danford Thomas enunciates opinions so completely in accord with the views expressed in the series of articles on Patent Medicines that have appeared in this periodical during the past two years, that, with his permission, this paper has been included in Vol. II. of the reprints, entitled "Patent *alias* Quack Medicines."

have been taken in mistake for something else, or taken as over-doses of medical preparations, the dangerous contents of which were unknown to the consumers. Despite the regulations and precautions which, to a certain extent, are imposed in this country by law on the sale of poisons, the would-be suicide manages to obtain what he wants in one way or another, and even, indeed, if effectually hindered in this method of self-destruction, would readily find some other means to accomplish his object. But, as I have mentioned, the larger number of deaths from poisons are classified as from "misadventure," using the word as opposed to a suicide or the wilful act of some other person. In some instances "neglect," not necessarily of a criminal character, may rightly be attributed either to the deceased person himself, or to the careless act of someone else. In the same year (1889) 63 deaths occurred where the kind of poison was not stated. As far as the large majority of deaths from poison is concerned, we can obtain fairly reliable facts and statistics; but it is impossible to even estimate the large number of persons who may suffer either from acute or chronic poisoning, who may recover, or who do not die from the immediate effects of the poisonous drug. Hospital records would reveal a considerable number, but to this must be added those which every medical man in practice encounters from time to time. It is well known that some of the poisons in the list I have given are contained in many of the proprietary and so-called patent medicines and nostrums, which are largely sold to the public, who procure and consume them without any knowledge of what they contain. It is true that, on analysis, many of these are found to contain harmless ingredients, but a large number of them contain "concealed poisons," such as morphia and the various preparations of opium, prussic acid, antimony, and other poisonous drugs as found in chlorodyne, black drop, soothing syrups, some balsams and elixirs, teething powders, &c. Even in so-called blood mixtures, arsenic and iodine of potassium have

been discovered in quantities capable of producing poisonous results. Dr. Hubbard, in his excellent pamphlet on "Homicide as a Misadventure," says, "Disasters, not inaptly termed 'runaway knocks at death's door,' are constantly occurring, the most frequent of which is profound coma for many hours. These have no public register; they are only recorded on the 'tablet of the memory' of the members of the family in which they occur, and in the diaries of medical men."

Having briefly referred to the deaths and cases of poisoning that arise, in so many instances, from preventible causes, I would draw attention to the sources from which these poisons are obtained, and the facility with which many of these are sold and purchased; and then, after mentioning the existing regulations affecting the sale of poisons in their naked and concealed forms, as permitted in England, I will endeavour to suggest what further regulations might, with advantage, be adopted in this country as a means of lessening the mortality from poisoning, and reducing the danger to health and life, which now exist from the indiscriminate sale of proprietary and other medicines containing "concealed poisons." There are three Acts of Parliament regulating the sale of poisons. The Arsenic Act, 1851, and two Pharmacy Acts, 1852 and 1868 respectively. These Pharmacy Acts contain two schedules of poisons, and when a poison contained in either schedule is sold, it must be labelled with:—(1) Name of article; (2) the word "poison"; (3) the name and address of the seller; and, in addition to this, when any poison in Schedule I. is sold, there must be an entry made in the poison book as to (1) date of sale; (2) name and address of purchaser; (3) name and quantity of article; (4) purpose for which it is wanted; and further, it is not to be sold unless the purchaser is known to, or introduced by, some person known to the seller.

The following are the lists of the poisons contained in the schedules referred to:—



## SCHEDULES OF POISONS.

## PART I.

Arsenic and its preparations ; aconite and its preparations ; alkaloids ; all poisonous vegetable alkaloids and their salts ; atropine and its preparations ; cantharides, corrosive sublimate, cyanide of potassium, and all metallic cyanides and their preparations ; emetic tartar ; ergot of rye and its preparations ; prussic acid and its preparations ; savin and its oil ; strychnine and its preparations ; vermin killers, if containing poisons.

## PART II.

Almonds, essential oil of (unless deprived of prussic acid) ; belladonna and its preparations ; cantharides, tincture and all vesicating liquid preparations of ; chloroform ; chloral hydrate and its preparations ; corrosive sublimate, preparations of ; morphia, preparations of ; nuxvomica, and its preparations ; opium and its preparations, and preparations of poppies ; oxalic acid ; precipitate, red (red oxide of mercury) ; precipitate, white (ammoniated mercury) ; vermin killers, containing poisons as in schedule.

Now it will at once be seen that there are a large number of poisons not included in the above lists, and these can be purchased without restrictions from anyone who likes to sell them. For example, carbolic acid, nitric acid, hydrochloric acid, sulphuric acid, phosphorus (as rat poison), can be procured at most chandlers' and oil shops, from one pennyworth upwards, by any person of any age ; and they can be sold, and often are, in any kind of vessel—ginger-beer bottle or tea-cup—without cork, label, or indication of any kind as to the nature of the contents. Poisons bought in this way cause a large number of deaths from poisoning, classified under the headings of misadventure and suicide. I should mention that the wholesale dealers are exempt from the operation of these Acts, so that any quantity of poisons could be procured through them without restrictions. A photographer told me that he had only to send his boy to the wholesale house, and he could

obtain as much cyanide of potassium as he wanted without any difficulty. Besides, then, the chemist and druggist, the Chandler and oil shop keeper, who sell poisons, there are about 13,600 tradesmen in Great Britain (other than those mentioned), consisting of grocers, linen-draper, general storekeepers, and others who are dealing in mysterious and secret medicines, many of them containing poisons the nature and property of which are absolutely unknown to the vendors. In the year 1888 there were in Great Britain 21,600 licences taken out for the sale of patent and proprietary medicines. Comparatively speaking there are very few patent medicines. The composition of a really patent medicine is known, and can be seen at the Patent Office. The proprietary medicine is a secret preparation, and hence preferred by the owner ; but both bear Inland Revenue stamps, and are vaguely termed by the public "patent medicines." Over £200,000 was realised by the Government last year from the sale of medicine stamps, and about £6,000 for licences to sell. These figures will give some idea of the extent of the sale of secret remedies which takes place annually in Great Britain, and it is also a painful record of what charlatanism and quackery are able to achieve in this so-called enlightened age. How far, then, should the State interfere as regards the health of the people in the sale of poisons and of secret medicines containing poisons ? In making regulations, care has been taken not to hamper the requirements of trade, and, bearing this in mind, I would respectfully submit that even if much stricter regulations were enforced, the purchaser, whether wholesale or retail, would not be subject to one-half the restrictions he has to submit to if he desires to remove a cask of wine or spirits from a bonded warehouse at the docks. As an amendment to the Pharmacy Acts, I would remove such poisons as morphia, laudanum, chloroform, nuxvomica, belladonna, chloral-hydrate, and corrosive sublimate from the second to the first list of poisons, and all those poisons already mentioned

that can be procured at the oil-shops should at once be placed in List No. 2, so as to ensure their being properly labelled, as directed by the Act. I would further make it compulsory that all such liquid poisons should be sold in a distinctively coloured bottle, and that no one under the age of sixteen years should be served at all. Such regulations would inflict hardship upon no one. With regard to the sale of proprietary and secret medicines containing poisonous drugs, I would have the contents clearly expressed on the label, and the word "poison" added, as required in the sale of such poisons under the present Acts. Let us see what the Japanese are doing in this matter. They have established a public laboratory for the analysis of chemicals and patent medicines. The proprietors are bound to supply a sample, with the names and proportions of the ingredients, directions for its use, and an explanation of the supposed efficacy. During the year 1889 there were no fewer than 11,904 applicants for licences to prepare and sell 148,091 patent and secret medicines. Permission for the sale of 52,638 different kinds was granted, 8,592 were prohibited, 9,918 were ordered to be discountenanced, and 70,943 remained still to be reported on. The majority of those authorised to be sold were of no efficacy, and but few were really remedial agents. The sale of these was not prohibited, as they were not dangerous to the health of the people. In Italy, only as recently as January 1st 1891, the sale of secret remedies became subject to the following very stringent regulations :—The composition, as to the quality and quantity of the active substances contained, must be written on the labels and on the advertisements; no special therapeutic virtue or indication shall be attributed to them either on the label or advertisement; they shall be sold only by chemists under the vigilance of the sanitary authorities, and with medical prescriptions. In France the pharmacien is forbidden to sell secret remedies, or even to keep them on his premises, under heavy penalties. In Germany the chemist may sell patent medicines, when

ordered by the prescription of the physician. He must not sell secret remedies. All patent medicines sold by the chemist must be prepared under special supervision, and according to the rules of the pharmacopœia. In America the law varies in each State, but, speaking generally, much reform is needed. Other nations seem in advance of Great Britain in the interests of the public health, as regards the precautions taken in the sale of poisons and of secret medicines containing poisonous drugs. We might wisely in many respects follow their example. I have one further suggestion to make as regards the sale of secret remedies. I would make all proprietary medicines really patent. I would abolish licences to sell them, and I would confine the sale to chemists and druggists only.

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### PUBLIC HEALTH REPORTS.

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KENSINGTON. — The parish of St. Mary Abbots, comprising the two registration sub-districts of Kensington Town and Brompton (which, again, are divided into three wards—namely, St. Mary Abbots; Holy Trinity, Brompton; and St. John, Notting Hill, with St. James, Norland), occupies the extensive area of 2,190 acres; while the fact that it is populous is sufficiently evidenced by its being constituted for Parliamentary election purposes into the two divisions, respectively entitled North Kensington and South Kensington. The enumerated population of the entire parish at the census of 1891 was 166,321. This total, large though it is, was considerably short of the estimated population, which Dr. Orme Dudfield, who has held the position of medical officer of health for upwards of twenty years, and is consequently able to speak with authority on all subjects connected with the demography of this important West End district, had put at a much higher figure, as had also the Registrar-General, calculating from the official data in his possession. As a matter of fact, the enumerated population



showed an increase of only 3,170 in the ten years between 1881 and 1891; whereas the increase in the two previous decennial periods was 50,000 and 43,000 respectively. The inhabited houses (including under this term a number of large buildings let in "flats" to separate families, but each building counted only as a single house) increased by 9·1 per cent. between 1881 and 1891, while the population, as enumerated, increased by 1·9 per cent. only. The obvious discrepancy is certainly most puzzling. Dr. Dudfield accounts for it, in part, however, by stating that the census was taken during the Easter holidays and the Parliamentary recess, despite the caution given to the authorities, a year before, that its occurrence at that period would probably lead to erroneous results as regards the western districts; seeing that very many families would be sure to be out of town at that time. The census discrepancy appears to fully confirm the wisdom of the caution that was given. Further, it is a powerful argument in favour of a more frequent taking of the census for enumeration purposes, which has been so persistently advocated in the columns of *HYGIENE*.

The present rateable value of property in Kensington is over two millions sterling; the exact figures in 1891 being £2,012,843. Barely seventy years ago—that is, in 1823—it was only £75,916, and the number of inhabitants was under 15,000. In the past thirty-five years, as Dr. Dudfield tells us, the population has nearly trebled, while the rateable value has actually trebled in twenty years, so that it is exceeded in England only by that of the cities of London, Liverpool, Manchester, and Bristol.

The marriage-rate in 1891—*i.e.*, persons married per 1,000 inhabitants—was 18·9, showing an increase over that of the three preceding years. In the whole of London the marriage-rate for the year was 17·7, also showing an increase over every year since 1887, when the metropolitan marriage-rate was only 16·8, being the lowest ever recorded.

The birth-rate for Kensington in 1891 was 23·1 per 1,000, being 1·7 below the decennial average (24·8). It is a notable fact that the Kensington birth-rate, which is much lower than that of London as a whole (31·8 in 1891), has been steadily declining since 1868, when it was 33·1 per 1,000. Here we have, apparently, another explanation, in part, of the difference between the actual and estimated population of the parish in 1891.

While on the subject of mortality and other corresponding statistics, we may mention some interesting details. The death-rate in "Greater London," comprising 5,657,000 inhabitants, was 19·8 per 1,000 in 1891. In the same year the death-rate in the twenty-seven cities and boroughs next in population to London, and having an aggregate of more than five million inhabitants, was 23·4, ranging from 18·2 in Brighton, 19·0 in Portsmouth, and 19·1 in Derby, to 26·0 in Salford, 26·5 in Manchester, 27·0 in Liverpool, and 27·3 in Preston. It will be observed that the four highest rates were recorded in four Lancashire towns, three out of the four being essentially manufacturing places, where many married women are engaged in the mills, so that their families are, to a greater extent than prevails elsewhere, deprived of the natural maternal care.

Looking abroad, we learn that in 1891, the mean death-rate of twenty-two of the largest European cities, having an estimated population exceeding twelve millions of inhabitants, was 24·6 per 1,000, ranging from 19·5 in the Hague, and 19·8 in Christiania, up to 24·5 in Vienna, 30·5 in Trieste, and 37·0 in Moscow. In the principal cities of America, the range was from 21·5 in Philadelphia, to 26·0 in New York, and 27·0 per 1,000 in New Orleans. Some large places in Africa and Asia presented death-rates of alarming proportions—namely, 45·4 in Alexandria, and 53·7 in Cairo; while the mortality in the three chief cities of our Indian Empire was 27·9 per 1,000 in Calcutta, 29·0 in Bombay, and 52·5 in Madras.

In reading through reports like that under notice, we cannot help being struck with the mass of information contained in the sanitary returns furnished by medical officers of health, and the immense amount of work done steadily, continuously, and unobtrusively by them and other members of the Public Health Service. The annual report for Kensington consists of 279 pages, large octavo ; besides which it should be mentioned that Dr. Dudfield issues a monthly report for every four weeks throughout the year.

The concurrence of a low death-rate from zymotic diseases with a low general rate of mortality is always satisfactory ; and Dr. Dudfield is consequently justified in directing special attention to the fact that such is the case in Kensington ; the rate of mortality from these diseases having been, in 1891, 1·6 per 1,000 persons living, as against 2·3 in the metropolis. Nor is this an exceptional condition of things ; for the decennial average was 2·1 in Kensington, as against 3·0 in the whole of London.

The most noteworthy epidemic in 1891, as well as in the previous year, was influenza, which attacked many people of all ages, and in all classes of society ; and, though the deaths directly attributed to that malady were not numerous, comparatively speaking, there is no doubt that it was responsible for a very great increase in the mortality from affections of the respiratory organs and of the circulatory system.

Clearing-houses exist for bankers and railways. With the development of the Public Health Service system we shall soon want one for medical officers of health ; in fact, we have the system at work already. In striking the rates of mortality for different districts, it is now customary to exclude the deaths of non-parishioners occurring at public institutions within their boundaries, and to include the deaths of parishioners taking place at hospitals, asylums, &c., beyond the boundaries. Dr. Dudfield even includes the death of one unfortunate parishioner who had, through some circumstance not mentioned, found

his way into H.M. Prison at Wormwood Scrubs, where he drew his last breath. The total number of Kensingtonians whose deaths are recorded as occurring during the twelve months outside the parish was 247, reminding one of the apocryphal anecdote told by an enthusiastic native of a place that was so healthy, that the inhabitants had to go into some other locality when they wanted to die.

Dr. Dudfield makes some excellent remarks on the subject of uncertified deaths, eight being returned as not having been certified, either by a qualified medical practitioner or by a coroner. It appears from the figures furnished in the report that the proportion of uncertified deaths throughout England and Wales has steadily fallen from 4·7 per cent. in 1879, to 2·8 in 1890. In 1891 it was 1·0 per cent. in London (0·26 only in Kensington), 2·7 in England and Wales, and as high as 7·0 per cent. in Wales alone, probably owing to the frequent remoteness from a qualified practitioner, and the consequent difficulty in obtaining medical attendance. It has been suggested that an inquiry into the cause of death, in all uncertified cases, should be conducted by the medical officer of health for the district ; but it would be obviously unfair to throw this duty upon already fully-tasked officials without a proportionate increase of remuneration. This matter has formed the subject of discussion at more than one meeting of the Society of Medical Officers of Health ; and, some years ago, the following resolution was passed, with the view of meeting the difficulty :—"That all cases of uncertified deaths should be reported by the local registrar of births and deaths to the coroner, who should, when there is no *prima facie* ground for holding an inquest, direct such cases to be investigated by a registered medical practitioner." It is not clear, however, that this arrangement would obviate the difficulty, unless some provision were made for payment of professional services thus rendered, as the coroner could not be expected to find the requisite funds. In France,



Germany, Austria, and some other European countries, every case of death has to be inquired into and fully reported on, by a medical officer specially appointed for that duty, before the dead body can be disposed of. This system is found to work well, and, if adopted in this country, would virtually remove the objection which has been raised by the opponents of cremation—namely, that that mode of disposal of the dead might in some instances allow of secret poisoning, without the possibility of any subsequent means of inquiry into the cause of death.

On the subject of compulsory notification of measles, Dr. Dudfield takes a somewhat opposite view to that held by Dr. Harvey Littlejohn, medical officer of health for Edinburgh, and some other health officers, whose reports have been recently noticed in these columns. As a matter of fact, notification and hospital accommodation must be concurrent; otherwise notification would be “practically useless,” as Dr. Dudfield says.

In addition to other sanitary work in Kensington during the twelve months, 6,655 houses were inspected, and 2,149 notices were issued, under the provisions of various Sanitary Acts.

Only twenty licensed slaughter-houses now exist in Kensington, and we hope that these may soon be done away with. “It is to be desired in the interests of public health,” Dr. Dudfield observes, “that private slaughter-houses may at no distant date give place to public *abattoirs*.”

*Bridlington, Yorkshire* (Urban District). Population, 8,909; occupied houses, 2,377.—The medical officer of health, Mr. W. A. Wetwan, reports that the net increase of the population during the ten years (1881-1891) was only 13 per cent. more than the natural increase, or excess of births over deaths, showing that although there has been a considerable immigration into the town, that has been largely neutralised by the removal elsewhere of the older inhabitants. The number of residents

is, of course, much increased temporarily during the summer months, owing to the influx of visitors to this growing health-resort.

Birth-rate for 1891, 25·1 per 1,000; general death-rate, 19·08 per 1,000; zymotic death-rate, 1·42. The increase of the general death-rate over that of the previous two years, 16·9 and 14·7 respectively, is attributed to the greater mortality from diseases of the respiratory organs and of the circulatory system, coincident with an outbreak of epidemic influenza.

Mr. Railston Brown, town surveyor and inspector of nuisances, and Mr. Francis Reed, the inspector appointed to visit dairies, milk-shops, cow-sheds, bake-houses, slaughter-houses, common lodging-houses, &c., have both done good service, as shown by their reports. From the report of the latter official we learn that there are no fewer than sixteen registered slaughter-houses in Bridlington, and that sanitary defects were discovered in seven of these, being nearly one-half of the total number.

*Bridlington* (Rural Sanitary District).—Area, 60,145 acres; population, 7,929, being actually 455 less than at the 1881 census.—The decrease is accounted for by the migration of many persons to other districts in quest of employment. The two principal parishes are Flamborough and Hunmanby, each with a population of about 1,300; the rest of the parishes being, for the most part, small and sparsely populated.

With the exception of Flamborough, where the majority of the male part of the population is seafaring, the inhabitants of the district are engaged in agricultural and kindred pursuits.

The death-rate for the year is stated by Mr. Wetwan as 18·8 per 1,000, the highest recorded for years, for which influenza is held responsible; the birth-rate was 31·02 per 1,000.

The chief sanitary improvement effected in the district was at Flamborough, where a drainage scheme has been adopted, and is in

progress of formation; the water supply of this fishing village is also under the consideration of the authorities, its high position (Flam-borough Head is a prominent feature of this part of the Yorkshire coast) and close proximity to the sea presenting unusual difficulties.

Mr. James Stephenson, the district sanitary inspector, reports only two cases of over-crowding, in his summary of work. Considering the extent to which over-crowding exists in rural districts—much more than dwellers in towns have any idea of—owing to the inadequate supply of cottage accommodation, this is satisfactory.

*Lowestoft* (Urban and Port Sanitary Districts).—The area of the borough of Lowestoft is 2,306 acres; the population, in April, 1891, was 23,151, varying considerably from the estimated population. As we have frequently noted in our columns, the difference between actual and estimated population was shown by the 1891 census to be great in many parts of England; the reason being that various circumstances must occur to disturb calculations made for so long a period as ten years. This fact is conclusively proved by the population of England and Wales at the last census having been over-estimated to the extent of 703,350 persons. The Registrar-General, commenting on this discrepancy, remarks that “such differences between estimates of this kind and reality are unavoidable when the interval between two consecutive enumerations is so long as ten years.” Fortunately, for the practical purpose of calculating the death-rate, the error was comparatively insignificant, amounting to only 0·21 per 1,000. Still, seeing that even this error might be avoided by making a more frequent—say, quinquennial—enumeration, it is to be hoped that the authorities will make arrangements for ascertaining the population at shorter intervals than is now the case.

In a town possessing a large seafaring population, and having a large periodical influx of

visitors, like Lowestoft, it is a difficult matter to arrive at any exact method of calculating the number of inhabitants. About the 1st of March, many hundreds of Lowestoft men leave home for the mackerel fishing on the South Coast, and, as they do not return till about the middle of June, they cannot, of course, be included in a census taken in April. In the winter, however, they are all at home in connection with the herring fishing, and their numbers are considerably augmented by fishermen from other ports, both English and Scotch. It may be briefly stated, according to Dr. W. A. S. Wynne, the medical officer of health for the Lowestoft urban and port districts, that any census taken at East Coast fishing places is under the estimate in April, whereas the reverse happens on the South Coast of England. Consequently, he is of opinion that, when all the fishermen are at home, the population of the borough does not fall far short of 25,000 persons.

The death-rate during 1891 was 16·25 per 1,000, the average of the previous ten years having been only 15·2. The increase is accounted for, as in other districts, by the prevalence of epidemic influenza, and the coincident increase of diseases of the respiratory and circulatory organs. The zymotic rate of mortality was 0·9, as against 1·83 per 1,000 for all England and Wales. Of the deaths registered, 105 were under one year of age, and 130 persons were sixty years of age or upwards. The birth-rate for the year was 33·06 per 1,000, as compared with 31·4 for England and Wales.

Reporting upon miscellaneous subjects, Dr. Wynne says that, having regard to the question of sanitation and economy combined, he has recommended the urban authority to use a mixture of protosulphate of iron (copperas) and gypsum for scavengering purposes, as at Aston, Birmingham. The medical officer of health for Aston had stated that “seventeen thousand loads of midden refuse were removed every year in his district, and there they had introduced



the use of powdered protosulphate of iron, which, mixed with a considerable quantity of crude gypsum, made a useful and convenient powder. It had a wonderful effect—not, perhaps, in the strict sense of the word as a disinfectant, but as a deodoriser.” The cost of this compound of copperas and gypsum in equal parts is about £2 10s. per ton. Dr. Wynne mentions that many persons are prejudiced against it, because it has not a sufficiently strong odour about it. Such objectors must take similar views to those of the student, who, being asked at an examination a question concerning the use of disinfectants, replied that they gave out such a disagreeable smell that people were compelled to open the windows and thus let in the fresh air.

The sanitary condition of lodging-houses must always be a matter of considerable importance in a health resort, and the frequent applications made by occupiers of such property to Dr. Wynne for certificates show that perfectness in this respect is appreciated. There are certain legal and official reasons which are held to debar public officials from giving such certificates; but Dr. Wynne has met this difficulty by keeping at the Town Hall a register of the sanitary condition of dwelling-houses in Lowestoft, for public inspection, containing the following particulars:—Date of inspection, situation of premises, sanitary condition of premises, and sanitary alterations made, with date at which they were effected. This system is expected not only to serve as a useful record for public inspection, but also to act as an encouragement to lodging-house keepers and others to have their places put in proper sanitary condition.

The report of work done during the year by the sanitary inspector (Mr. Philip Kelt) is of extensive character. No fewer than 7,000 houses have been inspected, and a large number of bake-houses, slaughter-houses (thirteen in the borough), dairies, &c., inspected regularly, and numerous sanitary improvements made. In addition, 640 ships were visited in the harbour.

In connection with fishing and commercial

interests, many English and foreign vessels come within the limits of the port sanitary district of Lowestoft, and all possible care has to be taken to prevent the introduction of disease into the locality by vessels coming from ports where zymotic disease is known to be prevalent. To mention a case in point, Dr. Wynne, having had his attention drawn by the town clerk to a statement in the *Shipping Gazette* that typhoid fever was prevalent at Scheviningen, in an epidemic form, took the precaution to inspect all recently arrived Dutch vessels. No cases of sickness were found on any of them, but on one there was a supply of drinking water which had been brought from the Dutch port just mentioned, and was intended for use on the return voyage. The captain asserted that this water was excellent, but the medical officer for the port had his doubts on the matter. On analysing some of the water, he found it of very bad quality, and evidently taken from some very impure source (a Dutch canal, probably). He, therefore, advised that the casks should be emptied, and filled with the Lowestoft Company's water, which was accordingly done.

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### CORK PAVEMENT.

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THE Archbishop of Westminster, at a meeting held at St. James's Hall, for promoting patronage of the National Society for the Prevention of Cruelty to Children, appropriately remarked upon the inconsistencies of human solicitudes, especially in England. For, whereas the Royal Society for the Prevention of Cruelty to Animals was instituted so long since as 1824, it was not until sixty years afterwards that children were made the objects of similar attempts at amelioration, and, judging from the fact that the pecuniary support of the children's society is so feeble that its accounts show a deficiency of £4,500, the animals, as has been remarked, seem to be getting decidedly the best of it.

Not that the best for animals is so pre-

eminently good. If it had been there would have been no roads made of asphalte or wood. Nothing but the exigencies of public authorities being in a difficulty could have led to their tolerating the modern innovations alluded to. Such public authorities are entitled to be condoled with on account of their manifold perplexities. Macadam, for heavy city traffic, having finally proved a total failure, and granite being, for intolerable noise, jolting, and other reasons, a constant theme for animadversion and discomfort all night as well as all day, what could the unfortunate authorities do? First of all they tried wood some time in "the thirties," Regent Street, Whitehall, and Oxford Street being amongst the earliest experiments. In all those cases the wood (after very brief endurance) was indignantly ordered to be torn up again, and it was not seriously attempted for a permanency prior to 1872, from which time it has gradually spread its treacherous footing, severely competed with by various kinds of so-called asphalte.

Asphalte and wood are both tolerated because they are less noisy and less jolting than granite; but the former is, after all, very noisy from the constant clatter of equine feet, and the latter is often as jolting as granite, while the thudding upon it is almost as disagreeable, or quite, as the clatter upon asphalte. Added to these drawbacks, they are both slippery beyond the possibility of precaution, and the only reason why they are successfully apologised for in these respects is because granite, when brought into the range of comparative tests, proves to be almost as slippery, if not quite. All three, when quite clean and dry, are tolerable as to foothold, but no more, and that only happens about once in a blue moon. When covered all over with slimy mud they are all three about equally dangerous to step upon, and that may be estimated at one-third or more of every year. But the peculiar vice of asphalte, and also of wood in a slightly less degree, is the variable character of the surface from the casual

slopping of wet, so that the horse, going quite freely over a considerable length of dry road, and suddenly stepping upon a wet and dirty place, is cruelly betrayed into a catastrophe for which he is not in the least responsible, that may result in a bad fall, an incurable strain, and exasperating impediment to the contiguous traffic.

All these characteristics of the roadways of London and busy towns are notorious evils—unmerciful to horses, extremely trying to drivers, incessant anxieties to conscientious officials, and the causes of many considerable expenses and injuries to valuable property. The Patent Cork Pavement Company is prepared to remedy all the evils, minor as well as major, before alluded to. That is a very large order, but it can be executed. Cork pavement, as introduced by that company, is calculated to save money, time, and oaths. It is made of bitumen mixed with granulated cork. The combination of these two substances has disclosed properties that were probably never foreseen by the original inventor. The most remarkable of these is that the resulting substance is a very refractory conductor of heat, so that, though the bitumen alone would melt in hot sunshine and become a quagmire, the admixture of the cork has such a magical effect that the finished article, though placed before a hot fire in the position of a hearthrug, is not thereby softened in the least. It possesses the additional qualities of imperviousness to cold, moisture, and frost; hardness to the touch, but softness to the tread, and slight elasticity under heavy weights; comparative silence under the heaviest traffic of wheels and the concussions of hoofs; and, beyond all else, perfect freedom from slipperiness, whether dry or wet. Its cost is no more than the best wood pavement, and its durability is immense, as certified by Messrs. Pickford & Co. after extremely severe tests.

Here we have before us a new material for horse roads that promises to give security against all the vices of granite, asphalte, and wood pavements, apparently leaving nothing to be desired. But horses have a further important interest in



this substance. Being a rapid drier, and also warm, it is admirably adapted for the floors of stables, as already experienced at Knightsbridge Barracks. It is equally available for stable-yards, and the quietude of all motions upon it renders it on that account of surpassing value wherever there are high-bred and sensitive horses, especially where it is necessary for them to rest during the day; thus, whether at home or abroad, the welfare, condition, increased ease in working, and prolonged efficiency of horses are all involved.

But, as His Grace of Westminster has so opportunely pointed out, animal welfare is not the only claim upon us. There are children, as he sought to impress upon us, and also men and women, all of whom should be interested in this cork pavement. Perhaps its desirability is most conspicuous in this connection with reference to the platforms and staircases of railway stations, where slippings and severe falls are far from uncommon in consequence of the polish of wear and of wet surfaces, to say nothing of discomforts arising from the condensation of fog and damp upon cold asphalte in moist weather. The warmth and consequent dryness of cork pavement, and the secure foothold it affords at all times, cannot fail to be eventually forced upon public and managerial attention. The like observations equally apply to all municipal and official buildings, all of which are open to improvement by the genial warmth and equally genial freedom from noise now placed within the reach of all.

Yet there is another application of cork pavement that should appeal not only to the eminent ecclesiastic to whom we have before referred, but to all interested in the perfecting of places of worship in general. It is difficult to appreciate sufficiently the convenience and comfort and charming quietude of a cathedral, for instance, paved all over with this new material; every footfall silent; every inconsiderate or involuntary movement hushed; even the sound of so little as a pin-fall barred against

distracting attention from the sweetest of the devotional music, from the earnestness of fervent prayer, from the impressiveness of the most moving passages of sermons, or from the dramatic effect of the vesper bell. Partial quietude for such interiors is commonly attempted by means of carpets or matting; but the cost of providing and renewing them is often onerous, and as they harbour and accumulate and diffuse dust in very objectionable ways, they can only be regarded as adjuncts to be dispensed with wherever possible.

Important as are the foregoing considerations, they must all be put in subordinate places by comparison with the bearings upon hygiene. Wood floors are liable to become permanent sources of infectious disease, from their absorption of deleterious gases and the harbouring of bacteria. Were it not for frequent scouring, these evils would become more demonstrative, and there can be no doubt that, notwithstanding the severe too drudgery imposed upon housemaids in private establishments and upon the nurses of hospitals in their initiatory stages, much unsuspected mischief does actually proceed from wood floors. Where there is no scouring, or very little, the risk is great, and many of the worst cases of unhealthiness in dirty dwellings are clearly traceable to the infected state of the floors.

Hospitals are especially concerned. Every non-professional visitor to a well-conducted establishment of that kind is of necessity struck with the scrupulous whiteness of the floors, indicative of admirable management and oft-repeated labours. But what is going on under the floors no eye can see, nor observation detect. Once anything wrong harbours there, who is to suspect it, and, being rightly suspected, who is to eradicate it? Now cork pavement is expressly prepared for floors. It will not absorb either moisture, or gas, or odour. In addition to that chief recommendation, it is warm compared to wood or any other floor, and noiseless to ordinary footfalls. These are considerations

that should prevail in every hospital where management is accompanied by wholesome anxiety to secure every available excellence. In workhouses, especially in their infirmaries, the same remarks apply. In prisons the invasion of cork pavement has already commenced on a large scale, Holloway Prison taking the lead.

One of the ways in which hotels may be extensively concerned is open to inspection in Liverpool Street Terminus, London, where the railway station cab-way, passing under the Great Eastern Hotel, is laid with cork pavement, to the great satisfaction of all concerned, the absence of noise being the primary advantage. In other respects those interested in hotels may refer with much advantage to the prior observations on stables, railway stations, and hospitals, in all of which particulars hotels may be appropriately included.

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## Reviews and Notices of Books.

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*Patent alias Quack Medicines: Vols. I. and II.*

Beaumont and Co. (Ltd.), 39, Southampton Street, Strand, London. Price 1s. per volume.

WHEN this series of articles upon Patent Medicines was commenced, two years ago, in the columns of *HYGIENE*, it was thought that the task which the editor of this periodical set himself was too great, owing to the wide range of subjects and the difficulties which he would necessarily have to encounter. However, the work has progressed steadily, as evidenced by the two volumes of reprints of the articles which appeared in 1891 and 1892 respectively.

Volume I. has already been put in circulation to the extent of many thousands, and Volume II. bids fair to equal if not to exceed it in this respect. It may be stated, without fear of contradiction, that never before has there been brought together such a mass of information

concerning the principal, because most largely advertised, quack medicines of the day.

No one can peruse one volume without desiring to read the other; while the low price at which they are published renders them well adapted for purchase with a view to presentation to persons so foolish, so ignorant, or so credulous as to pin their faith on this or that nostrum. Indeed, the publishers are, we may state, prepared to supply medical gentlemen and others wishing to have copies for distribution with any number from one dozen upwards on trade terms—namely, at the rate of a trade dozen (thirteen) for 9s.

The reports, analyses, and articles in Vol. I. comprise, amongst other matters, Clarke's Blood Mixture, Sequah's Oil and Prairie Flower Mixture, Mother Seigel's Syrup, Mattei's Electro-Homœopathic Remedies, Chlorodyne and other Opiates, Holloway's Pills and Ointment, Revalenta Arabica, Allen's World's Hair Restorer, Mexican Hair Restorer, Rowland's Kalydor, Gowland's Skin Lotion, Singleton's Golden Ointment for the Eyes, &c.

Vol. II. commences with a trenchant article on Beecham's Pills—which the Editor of *HYGIENE* puts down as costing about a penny per box, while Beecham boastfully advertises them as "worth a guinea a box!"—followed up by other eye-openers about Warner's Safe Cure, St. Jacob's Oil, Congreve's Balsamic Elixir, the Gold Cure for Drunkenness, Morison's Pills, Baillie's Pills, Silvertown's Cure for Deafness, Mattei's Electricities, Dixon's Pills, Nicholson's Ear Drums, Owbridge's Lung Tonic, Electric Belts, Lane's Catarrh Cure, &c. This volume also includes an admirable paper, read by Dr. Danford Thomas, the well-known coroner for London and Middlesex, at the International Congress of Hygiene. This article, entitled "The Extent to which the State should exercise Control over the Sale of Poisons," is full of interesting information, and completely bears out the views expressed by the Editor of *HYGIENE* in his articles on Patent Medicines.



It is intended to continue the series in future numbers of *HYGIENE*, and all who are interested in the exposure and suppression of quackery are urgently requested to assist the Editor, both by giving useful information for future articles, and by promoting the circulation of the reprints containing those already published in these two volumes.

*Health Gossips for Women.* By George Hawkins-Ambler, F.R.C.S.E. 128 pages. Liverpool : Edward Howell.

ALTHOUGH the author of this book styles its contents, somewhat self-depreciatingly as some would think, gossip, his book abounds with good, sound advice to the large circle for whom it is written ; who will find in its pages valuable hints and suggestions concerning such matters as the education of women, the care of girls, dress, over-dosing with medicine, exercise, the management of the skin and teeth, bathing, sleep, diet, and other questions of personal hygiene.

It is written in an easy, chatty style, persuasive without descending to lecture people. If the authors of works of hygiene would only keep in mind that the way to touch their readers is by speaking to them in plain English, giving clear reasons where reasons are requisite, instead of displaying their superior knowledge by the frequent use of technical expressions—so much jargon to the uninitiated—they would do good. Otherwise, they are much more likely to do harm, and to add to the number of fads, to which the author devotes a very amusing chapter.

Another chapter, specially excellent, is that on “whips” ; not actual scourges, but the various means to which people afflicted with weak nerves, or enfeebled constitutions, or who are suffering from the effects of worry and over-work, or who imagine that they require stimulation, are much accustomed to resort. Foremost amongst such whips is, of course, alcohol. Evidently, Mr. Hawkins - Ambler does not hold with nips any more than he does with

“whips,” and he thoroughly explains why they are injurious, and how it is that the habit of resorting to such methods of rousing the flagging powers, and reviving the drooping spirits, grows upon a man or woman till it acquires the complete mastery. But, it is not alcohol alone that may thus subjugate a person of weak resolution. Tea, when drunk as it is in excess by many hundreds of thousands of women throughout this country, is second only to alcohol in the mischief which it works. “Poor working women,” says the author, “oppressed with endless care and trouble in their homes, surrounded by troublesome children, and living lives of abject slavery, drown in the teapot the cares their husbands lose in beer. With Jack away, they have not spirit to prepare a proper dinner, but take refuge in a ‘cup of tea.’ Here always they find solace ; they drink it at breakfast, dinner, and tea ; or, if not at a meal, soon after ; and I have met those who drink it during the day, as strong as they can make it, and as often, ‘to keep them going.’ This habit grows as quickly as any other form of tipping, and is worse than some.” What is the certain consequence of this perpetual brew, not of beer, but of tea ? Why, that they become victims to neuralgia, dyspepsia, and the numerous troubles summed up in the feminine diagnosis, “Nerves.” And, finally, in many instances, these tea-drinkers, being too blind to see their folly, fly for relief to some widely-puffed quack remedy ; and go to swell the army of weaklings, bodily and mentally, who pin their faith on electro-homœopathy, magnetic belts, Clarke’s Blood Mixture, Mother Seigel’s Syrup, Sequah’s Prairie Flower Mixture, and numerous other nasty nostrums.

*A Thousand Tit-Bits of Curious Information.*  
438 pages. London : George Newnes  
(Limited), Southampton Street, Strand.  
1892.

THIS book is, as its name implies, a collection of an immense quantity of useful and curious

information which has appeared at different times in the columns of the interesting and instructive paper, *Tit-Bits*; being the fifth volume of the same kind which has been published. It is a capital book to pick up, when one has to while away an odd quarter of an hour; and it is worthy of a place as a reference book in every library.

### SYDNEY SMITH ON INDIGESTION.

REFERRING to the peculiar pranks which indigestion plays on the mental disposition of dyspeptic individuals, this able scholar and witty writer gave the following humorous account of the horrors of indigestion:—

“The longer I live, the more I am convinced that the apothecary is of more importance than Seneca, and that half the unhappiness in the world proceeds from little stoppages, from a duct choked up, from food pressing in the wrong place, from a vexed duodenum,\* or an agitated pylorus. The deception, as practised upon human creatures, is curious and entertaining. My friend sups late; he eats some strong soup, then a lobster, then some tart, and he dilutes these esculent varieties with wine. The next day I call upon him. He is going to sell his house in London and to retire into the country. He is alarmed for his eldest daughter's health. His expenses are hourly increasing, and nothing but a timely retreat can save him from ruin. *All this is lobster*, and when over-tasked nature has had time to manage this testaceous incumbrance, the daughter recovers, the finances are in good order, and every rural idea effectually excluded from the mind. In the same manner, old friendships are destroyed by toasted cheese, and hard salted meat has led to suicide. Unpleasant feelings of the body produce correspondent sensations in the mind, and a great sense of wretchedness is caused by a morsel of indigestible and misguided food.”

\* For the Physiology of Digestion, see HYGIENE, Vol. V., p. 234.

## Notes and News.

AN OMNIBUS WITH PNEUMATIC TYRES has been started in Glasgow. There is no jolting or jarring whatever in the case of this vehicle, which we hope to see introduced into the metropolis and other large towns in place of the present uncomfortable, lumbering, bone-shaking machine. The tyres on the wheels of this model vehicle measure about  $3\frac{1}{2}$  in. in diameter, and can withstand a pressure of 187 lbs. to the square inch. To guard against the possibility of the india-rubber being punctured by sharp stones, broken glass, &c., the tyres are thoroughly protected by several folds of canvas, together with a covering of wire-wove netting. It should be mentioned, as an additional source of comfort to passengers, that at night the omnibus is illuminated by an electric lamp.

\* \* \*

“FOURPENNY” CHEESE sounds cheap, and, on examination, proves to be nasty; thus bearing out the frequent connection between these two adjectives. It appears that a provision dealer named Thompson, carrying on business in Smithdown Road, Liverpool, has been in the habit of selling the article known by this name. It is made from skim milk, and fortified, so to speak, with beef fat, finding a large sale in the poor districts of towns. The counsel for the defence, when Thompson was summoned before the stipendiary magistrate, urged that the addition of beef fat rendered the stuff more wholesome and digestible, and also argued that the case did not come under the Adulteration Act, inasmuch as cheese was a compound substance, to which various ingredients were added for the purpose of determining its nature and quality. The magistrate imposed a penalty of £5 and costs, with liberty to appeal; giving it as his opinion that manufacturers and vendors of “fourpenny” cheese must adopt a specific name for the compound, so that purchasers could have a proper idea of what they were buying.

\* \* \*

PRIVATE SLAUGHTER-HOUSES have been so repeatedly condemned that it is a matter of astonishment that any remain; but, then, vested interests die hard and are difficult to eradicate, however flagrant they may be. If there be any persons who still regard the private slaughter-house as an unfairly attacked institution, we would recommend them to peruse a pamphlet published by the Humanitarian League. Its title is “Behind the Scenes in Slaughter-Houses,” and its author is Mr. H. F. Lester, honorary secretary of the London Model Abattoir Society.

\* \* \*

SLAUGHTERING BY ELECTRICITY was, a few years ago, spoken of hopefully as likely to do away with many of the evils inseparable from the act of killing



animals intended for human food. But there are three objections to this method, according to Mr. Lester—viz., 1. The meat of the animal so killed is found to be streaked with black lines, and this although the blood is let out in the usual way. Probably no harm at all would result from the consumption of meat thus marked, but it is impossible to expect butchers ever to adopt a system which would have the effect of frightening away half of their customers. 2. The method of slaughtering by electricity is attended by some danger to the operators. 3. It is not absolutely certain that this method is painless to the animals killed. In the long run the use of anaesthetics may be adopted as a more humane system than any other.

\* \*

**THE NEW RAILWAY RATES.**—In the second half of the last century, British naval affairs were going so badly that it was deemed necessary to satisfy public indignation by bringing one of the admirals of the fleet before a court-martial, and afterwards executing him; a circumstance which gave rise to the witty French observation that "in England they kill an admiral to encourage the others." Similarly, the railway companies, as the outcome of the Railway Commission, which has been occupied for several years in the settlement of the important question of rates, seem bent on charging excessive prices for the carriage of agricultural and dairy produce as an encouragement to the already too heavily-handicapped British farmer.

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**THE ASHBOURNE DAIRY FARMERS' ASSOCIATION** held a meeting lately, at which it was stated that the farmers could not compete with foreigners in the London market, owing to excessive railway rates. Normandy butter could be delivered in London at a freightage of a farthing per pound, while Derbyshire butter could not be got to the metropolis under a penny per pound.

\* \*

**GROSS NEGLECT BY A SANITARY AUTHORITY.**—An application was made, on December 24th, to the magistrate sitting at the West London Police Court. The applicant stated that about twelve months ago an order was made at that Court upon the owner of the house in which he lived, at Fulham, to execute certain sanitary work, the urgent necessity of which may be judged from the fact that the order was made for the work to be done within seven days. After the order had been made, the sanitary inspector who obtained handed it to the applicant, who forwarded it to the agent of the landlord. No notice had been taken of the matter, and the nuisance remained as before. The applicant also stated that one of his children had been removed to the hospital on the previous day, suffering from diphtheria; and that the agent was a vestryman, a circumstance which was suggested as explaining the intolerable and apparently inexplicable

delay. The magistrate observed that there seemed to be great neglect on the part of someone in power, and advised the applicant to lay the facts before the Local Government Board, unless the sanitary authority of Fulham promptly enforced the order.

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**IS "HIGH" GAME UNFIT FOR HUMAN FOOD?**—A poulterer in Marylebone having been prosecuted for exposing for sale a number of rabbits in a half-putrid condition, it has occurred to the public analyst for the district (Dr. Wynter Blyth) that someone might suggest that the sanitary officers ought similarly to seize and condemn "high" game. But the difficulties in the way are, first, that the purchaser is not deceived in such a case, and, second, that many people have acquired "the filthy and disgusting habit" of eating game in a decomposed state. That it is also a habit injurious to health is a fact that is beyond doubt when it is considered that numerous "ptomaines" and other poisonous chemical compounds can be extracted by analysis from the flesh of a putrid bird.

\* \*

**CLEARING AWAY SNOW** from our public thoroughfares is always a puzzling problem for local authorities. A novel method has been resorted to in Budapest, and is reported to have succeeded better than the slow process of shovelling and carting the snow away. A steam engine was taken into the streets, the snow shovelled into the boiler, melted, and then discharged into the gutters, whence it found its way into the sewers.

\* \*

**A BOARD SCHOOL IN A BAD SANITARY CONDITION** is one of the greatest possible dangers to health that could exist in any locality. Yet that there are such places, has been shown by recent proceedings taken against the London School Board. At the Clerkenwell Police Court, within the last few days, two summonses have been taken out by the Local Sanitary Authority against the London School Board, to compel the remedying of defective drainage at two of the schools in the district. The defence set up was that as the drains were in a bad state a concrete pavement had been laid over them to prevent the escape of sewer gas, a fallacy which was speedily exposed by the medical and other witnesses. Complaints are occasionally made of the increasing expenses of the London School Board; at any rate, the public have a right to expect efficiency, instead of mere patchwork policy in the expenditure.

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**DIPHTHERIA** appears likely for some time to come to seriously affect the metropolis. In the third week of December some sixty fatal cases of this malignant malady were registered, being more than double the recorded average.

# HYGIENE,

A MONTHLY SANITARY AND SOCIAL MAGAZINE.

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No. 62.

## SPECIAL NOTICES.

EDITORIAL.—The Editor begs to express his thanks to numerous correspondents, and to state that he will be pleased to receive any communications and articles coming within the scope of *HYGIENE*, reports of medical officers of health, items of local or general sanitary interest, &c.

PUBLISHING.—*Subscriptions* for 1893 are now due. *HYGIENE* will be sent for twelve months, post-free, on prepayment of 6s. only, to any address in Great Britain, Ireland, United States, Canada, France, Germany, Austria, Belgium, Netherlands, Italy, Spain, Portugal, Switzerland, Prussia, Denmark, Norway, Sweden, and other countries included in the Postal Union.

## THE INSPECTION OF MEAT WITH REFERENCE TO THE SPREAD OF DISEASE.

By D. E. SALMON, D.V.M., Chief of the United States Bureau of Animal Industry.

THE inspection of meat, as a sanitary measure, has been attracting more and more attention with each succeeding year, and the scientific questions bearing upon this subject have been investigated with much vigour and patience. Results have been obtained of great importance; and, while we have undoubtedly much yet to learn, we have reached a point

where there can no longer be reason for the great differences of opinion which have caused so much discussion in times past. It is not my intention, however, to enter into the details of the researches to which reference has just been made. I prefer to treat the subject in a more general manner, and to suggest certain topics which may be discussed with much profit.

The meat-inspector's duties are not confined to condemning the carcasses of animals which are affected by a disease which may actually be transmitted to the consumer, but he must act with equal energy when confronted by conditions which may be accompanied by the unusual production, or the retention of, noxious compounds within the tissues. Further than this, in the high development of civilisation at the present day, the sensitive consumer expects to be protected from the use of animal food which, though not positively harmful, is obtained from animals whose condition would be repugnant or disgusting to him were he to see them before their slaughter.

Conscientious meat inspection is no easy task, for a disease which may not be communicable may cause the presence of a poison which would be as injurious as the malady itself; and a disease or a condition, which is neither communicable nor known to be in any way harmful, may be of such a nature as to be repugnant to our cultured tastes, though it would bring no hesitation to the minds of savages. The meat-inspector must



therefore be a man with some knowledge of science, who can tell from the lesions which he sees the nature and the invisible effects of the disease which produced them, and he must be sufficiently a man of the world to condemn, for decency's sake, certain carcasses which, to the best of our knowledge, would not be injurious to the consumer. He must also be a man of discretion, because there is no hard and fast line as to where a disease in its development becomes injurious, or a condition repugnant.

The methods according to which the meat-inspector works are of the greatest importance in determining the value of his services. It has been customary in many places to rely upon an examination of the carcass after it has become cold, or of the meat as it is exposed for sale. Although the experienced inspector becomes extremely expert, and can detect conditions which most persons would fail to observe, this method is wanting in accuracy, and is insufficient to detect all diseases which should subject a carcass to condemnation.

Having lately been engaged, under the direction of Senator Rusk, of the Department of Agriculture, in inaugurating a national meat inspection service in the United States of America, in accordance with a recent Act of Congress, I have had occasion to give considerable attention to this subject. For our inspection service it has been decided to be essential that an inspector should see every animal before it is killed, and should be present to examine the viscera when removed from the carcass.

With a single animal such an inspection is simple enough; but when we enter an abattoir with a killing-floor acres in extent, where from two to three thousand beeves are slaughtered daily, the problem suddenly becomes complex, and can be solved satisfactorily only by proceeding systematically, and by a division of labour.

The difficulties will be appreciated by anyone who visits the abattoirs of the foreign animal wharves at Deptford, in London, or the immense

packing-houses at Kansas City, Omaha, and Chicago, in the United States. An inspection of these great establishments, however, while difficult, is by no means impossible. With a sufficient force of inspectors, properly stationed, every animal can be examined as it goes to the abattoir, and every carcass can be seen while the butcher is removing the viscera.

According to the system adopted in the United States, there are outside inspectors and inside inspectors. The outside inspectors are not expected, of course, to feel the animals' pulse or take their temperature, or auscultate their lungs; but they are expected to see if the general appearance indicates health—to reject animals which have been injured during transportation, or which have external swellings or abscesses likely to affect the system of the animal. In case of doubt, they notify the inside inspectors, who give the animal in question particular attention. The inside inspectors examine the viscera of every animal, and as both inside and outside inspectors must be veterinarians, they are able to decide at once as to the nature of any disorder which they observe, and its effect upon the carcass of the animal.

What are the conditions which justify an inspector in condemning a carcass, and ordering its destruction? Surely, we cannot limit him to diseases which are with certainty communicable to man through the consumption of affected meat. Should we do so, meat inspection would be regarded by the majority of consumers as an unmitigated farce.

Take as an example the class of diseases of which rabbit septicæmia\* is a type, and which includes, besides the malady just mentioned, fowl cholera, swine plague, a form of pneumonia in bovine animals, and the disease described by the Germans under the name of *wildseuche*.† This class of diseases is widely

\* A diseased condition of the body arising from blood poisoning.

† A distemper observed amongst game and wild animals.

distributed over the world ; it affects nearly all species of meat-producing animals ; it is accompanied by constitutional disturbances and tissue changes of a very marked character. And yet, so far as we know, these maladies are not communicable to man, nor am I aware of any special evidence demonstrating that the meat affects the health of the consumer in any way.

Mons. Reynal says, in his article on fowl cholera, in the veterinary dictionary of Bouley and Reynal, *Nouveau Dictionnaire de Médecine, de Chirurgie, et de Hygiène Veterinaire*, vol. iii., page 658 :—"A labouring man at the School took, in 1851, all the fowls which died of the inoculated or the spontaneous disease ; they were used for the nourishment of himself and his family of five children ; none of these were incommoded by this alimentation. Like observations were made by Baronio, in Lombardy, and by Grogner ; the dead fowls were consumed without the least inconvenience. In 1851, when this epizootic had invaded nearly all the farms in the suburbs of Paris, masters and servants consumed, without being incommoded thereby, the fowls which died or which were killed during the course of the disease. Daily, these fowls were purchased by the dealers from the farmers, and sold either to their customers, or in the market of *La Vallée* ; these sales were made, no doubt, without the knowledge of the authorities, but we can affirm, in the most absolute manner, that the meat occasioned no derangement to the health of the persons who made use of it. The innocuousness of the meat of fowls which had been affected or actually died from the effects of this epizootic malady is demonstrated by facts so numerous and so authentic that the authorities ought to tolerate the sale of them."

Various authorities have also advised against the condemnation of the carcasses of bovine animals which are affected with the contagious pleuro-pneumonia. In France, the sale of the carcasses of animals slaughtered with this disease is left to the discretion of the veterinary in-

spector ; and in Great Britain, if Prof. Walley is correct, it is the universal rule to pass them as marketable and innocuous, "if they present no departure from natural conditions, the affected portion of the pleura being removed by stripping, and, in bad cases, the portion of the fore-quarter contiguous to the pleuritic lesion, or even the whole of the quarter, being kept back." In the United States, during the work of eradicating pleuro-pneumonia, the carcass of every affected animal was destroyed.

It has also been a common practice in European countries, during outbreaks of foot-and-mouth disease, to slaughter animals for food even when the fever was at its highest point. This is shown by some short quotations from Professor Walley's work on meat inspection. He says : "During the prevalence of an epizootic of this disease, thousands of animals, while labouring under its effects, are slaughtered, and their flesh used for human food. . . . So far as I am aware, there is no instance on record of the transmission of the disease to man through the medium of the flesh of affected animals. . . . In reference to the use of the affected parts as articles of human food, no difference of opinion need exist if the feet, the tongue, or the udder are the seat of local lesions ; they should be destroyed ; and the same rule applies to the tripe ; but I cannot agree with those who would condemn *in toto* the head, the heart, and similar organs."—Pp. 118, 119.

These short quotations are good illustrations of the fact that a contagious disease, having a virus of extraordinary virulence for certain species of animals, may not render the flesh of such animals actually harmful to the consumer. The carcasses of animals which have died of such diseases, or those which have been slaughtered after the first symptoms have appeared, should, however, in my judgment, be rejected, or the consumer should be informed of the malady from which the animal had suffered.

With us, in the United States, an animal which is ill, no matter what the disease, is con-



sidered as unfit for food, and our people would not knowingly tolerate an inspection which allowed the carcasses of such animals to go upon the market. From having for a long time an abundant supply of cheap meat, our people are accustomed to choose the best cuts from the best animals, and they are extremely impatient in regard to any policy which has a tendency to allow a food product to be placed upon sale which they would reject were they to know all the facts concerning its origin.

An animal which has a decided elevation of temperature from any cause, whether from the effects of a contagious disease, or from an ordinary fever, or from a severe injury, is, according to our standard, unfit for human food. An animal in an advanced condition of pregnancy, or a parturient animal, and unborn or recently born animals, are pronounced unfit for food. For the same reason, animals with large abscesses, whether these affect the general condition or not, and those affected with actinomycosis and tuberculosis, whether generalised or not, are all condemned.

In the condemnation of cattle affected with actinomycosis, we have probably gone farther than any other country, since beeves in perfect condition have been condemned when they only presented a tumour on the maxillary bones, the size of a walnut. It is in defining the exact point in the progress of such conditions, where condemnation is called for, that we find the greatest difficulty in meat inspection. If a suppurating tumour on the jaw, ten inches in diameter, calls for condemnation of the carcass, why should not one which is eight inches, or even six inches in diameter; and, if these are condemned, what shall we say of those which are five, four, three, and two inches only? Where shall the line be drawn? This is a question which might well be discussed at considerable length during the sessions of this Congress,\* for actinomycosis is becoming the disease

most frequently encountered in the large stock-yards of the world. Again, should we allow a female animal to be slaughtered for human food the same day that it has given birth to its young, or at a time when parturition is evidently near at hand? If not, how many days shall the owner be compelled to maintain the animal before it is slaughtered, and at exactly what age is the offspring to be considered fit for food? These are problems which confront the meat-inspector; they are essentially sanitary problems and of interest the world over. The United States Government is now attaching a numbered card, bearing the words, "inspected meat," and the signature of the Secretary of Agriculture, to each quarter of beef that has been inspected. This card is attached by means of a wire and lead seal. To identify inspected meat in boxes, packages, or cans, a meat inspection stamp is affixed to each case. All meats covered by these stamps are the product of animals that have been inspected before and at the time of slaughter, and, in the case of pork, specimens from each carcass have been examined microscopically and pronounced free from trichinæ. Sanitarians, no doubt, will feel like inquiring as to the necessity of an enormous inspection service to search for a microscopic worm, which is killed by a comparatively low temperature, and even by the ordinary processes of curing of meat. When meat is thoroughly cured or cooked, there need be no fear of this parasite. We have in the United States a population of about sixty-four millions of people, which consumes more pork per head than is eaten elsewhere in the world. Many of our people eat ham which has been salted and smoked, but not cooked. And yet trichiniasis is an exceedingly rare disease, and in every case that I have investigated, and this includes most which have occurred in recent years, it was contracted from eating raw meat that had not been salted. The most reliable protection from this parasite is, therefore, to have all varieties of swine-flesh either salted or cooked before they

\* The International Congress of Hygiene, held in London, before which this paper was read.

are eaten. I contend that salting and cooking is a better protection than microscopic inspection, because we have no trichiniasis in the United States from meats so treated, nor have any cases been caused in Europe by the millions and billions of pounds of salted pork that we have exported. On the other hand, there have been frequent and terrible epidemics of this disease in Germany, from the time microscopic inspection was instituted, about 1875 or 1876, until the present day, and many, if not all, of these epidemics resulted from inspected pork. The United States, however, is a meat-exporting nation. It recognises the fact that its meat inspection system has become a matter of international interest, and is determined to make it so rigid and comprehensive, that it cannot be excelled by the most progressive nation in the world. We have not been entirely lacking in inspection in the past. We have had Board of Trade inspections, Municipal inspections, and State inspections, and we now have, in addition, the National inspection. Much of the meat will, in future, be examined by all four of the classes of inspectors, and, if there is any value in inspection, the consumer should hereafter eat American meats with a feeling of great relief and confidence. The great interest in scientific research at the present day, the rapidity with which the literature of all nations is circulated, the numerous occasions on which scientists of various countries meet in international congresses, are bringing about greater uniformity of opinions, and a clearer idea of the reasons for national or individual variations from our standard. Admitting this, there can be no doubt that the sanitary regulations of different countries will continue to approach more nearly to a common standard, until the people of any one nation can visit the people of any other nation, live in their dwellings, mingle with their crowds, and eat their food without fear of sacrificing their health by so doing. With all the energy of recent scientific investigation, it is a fortunate outcome that so staple

an article of food as meat should prove to be less frequently a medium for the dissemination of disease than a few years ago we had reason to believe. Even tuberculosis cannot be distributed in this way to the extent we once supposed, or we should find it more frequently located in connection with the digestive than with the respiratory apparatus. And the products of the multiplication of disease germs are not as dangerous when taken into the stomach as we once believed, or those who consume the flesh of animals which have died of, or were affected with, fowl-cholera, pleuro-pneumonia, and foot-and-mouth disease, could not do this with the impunity which has been proved to be possible. Indeed, I had occasion to show, several years ago, that the products of certain pathogenic bacteria failed to produce the same specific effects when administered by way of the stomach that they did when injected hypodermically. Dr. Koch afterwards made the same observation in regard to the use of the products of the bacillus of tuberculosis. We may feel assured, therefore, that some of these products, at least, are so changed by the processes of digestion as to lose their peculiar properties. No doubt there is much yet to learn in regard to the communicability of animal diseases, and even more to learn about the effects of bacterial products; but it is a relief to know that some of the fears which we once entertained—with good reason—are now believed to have little foundation. It appears to me that there has been a tendency among many writers on sanitary subjects to exaggerate the dangers of contracting disease from eating meat as it is exposed for sale in the ordinary markets of the world. This tendency is to be deprecated, because it is a serious matter to arouse the suspicions of the masses in regard to a staple article of food, of which in most countries they always consume too little. A well-nourished people is a contented and healthful people, and it is the duty of sanitarians to assist in attaining this condition, rather than to make its accomplishment more difficult by



arousing groundless suspicions and fears in connection with one of the cheapest and best constituents of the diet. As already stated, some of the reasons which were once held for accusing meat as a disseminator of disease are undoubtedly untenable with the recent advances of science; others may prove to be equally groundless. Is it not best to maintain a wise conservation, and prove the danger before we herald it abroad? But this is not intended as an argument against inspection. On the contrary, I hold that inspection should be extended, made more thorough, and that carcasses of diseased animals, now allowed to go to the meat markets of many countries, should be condemned and destroyed. By so doing, any possible danger would be removed, and the confidence of the people in their daily food would be increased.

### **DRAINAGE AND IRRIGATION OF LAND IN THEIR RELATIONS TO HEALTH.**

By RICHARD F. GRANTHAM, M.I.C.E.

*(Concluded from page 7.)*

It appears that the evils attending irrigation in India are due to interference by the canals with the natural drainage of the country, and to over-saturation of the soil, resulting in the formation of marshes. Inquiries were made to ascertain to what extent the health of the population living in the irrigated districts suffered, but it was found impossible to obtain statistics of their previous condition for comparison. It was determined, therefore, to rely on the evidence to be obtained as to the enlargement of the spleen—a certain consequence of malarial diseases. Investigations were made, and, as a result, it was recommended that, as in the plains of Lombardy, great cities and military cantonments should be protected by zones round them, of from three to five miles' radius, being kept free from irrigation.

It has been stated on high authority that malarial fever is by far the principal cause of disease and death in India. In 1864 it was reported that the whole area irrigated by the Western Jumna Canal required thorough drainage, and that 60,000 acres were affected by "reh" efflorescence. The mortality from fever over the area watered by this canal was so terrible, that the cantonment of Karnal had to be abandoned. Again, in 1867, it was reported that from 61 to 80 per cent. of the residents were suffering from splenic disease. Dr. Thornton, C.S.I., from whose paper read before the Society of Arts, in 1888, I have derived much information, goes on to say that, since his paper was written, "a system of surface drainage is being carried out; but surface drainage, though valuable and important, merely provides an outlet for surface waters, and is no remedy for excess of subsoil water resulting from constant irrigation added to the natural rainfall. The proper remedy is subsoil drainage; but subsoil drainage has not yet been attempted."

From the evidence thus adduced we are enabled, in some measure, to appreciate the wide extent of land subject to the influence of malaria, and the degree to which inhabitants are affected by it. It will have been observed that malaria is prevalent, not so much when the land is completely covered with water as when the water has partly evaporated, or been partly drained off, and the decaying vegetation, in a damp state, is exposed to the heat of the sun. Further, that in winter the danger is less than in the spring, when evaporation becomes more active.

The only safe conditions, as regard health, upon which irrigation of any kind can be allowed, lie in its flowing on to, and off or through, the land without being permitted to stagnate; and, where the subsoil is of a retentive character, or the surface is so flat that water cannot escape, in providing subsoil drainage with proper falls to facilitate filtration, and thus avoid stagnation.

So far I have considered the varying conditions under which irrigation of any kind exercises an influence upon health, and have shown that, by the proper drainage of marshes, naturally formed, and of swamps, created by irrigation works, malarious diseases will die out. But, although this is the chief benefit of efficient drainage, it is also accompanied by considerable increase in the prosperity of the country, the soil, when drained, being mostly very rich and fit for profitable cultivation. I propose to refer to some important instances.

Looking abroad, we find several encouraging examples. In France, near the mouth of the Gironde, not far from Bordeaux, the drainage and improvement of 1,500,000 acres of desert land has been steadily progressing, and in the plains of Forez, on the banks of the Loire, in the basins of the Mare and Vizezi, works of drainage and irrigation have been carried out over an area of about 100,000 acres; the increase in the value of the land in the basin of the former river having been reckoned at 25 per cent., and in that of the latter at £48 11s. per acre. The cases of fever have been much diminished in number and severity.

Again, in Southern Italy, the marshes near Fondi used to emanate during the summer months pestilential exhalations which, it is said, infected and poisoned the atmosphere for miles round. The total area of the marshes was 12,000 acres, of which at least 10,000 have been drained since 1882, and let freely at £5 per acre.

In Russia, the drainage of the Pinsk Marshes, on the Russo-Polish frontier, containing about 25,000,000 acres, and said to be the largest bog in Europe, has been steadily carried on at the rate of about 400,000 acres per annum.

Mr. Bailey Denton, in 1861, stated that the total area in Great Britain, undrained or capable of improvement by draining, was estimated at 22,800,000 acres out of a total of 56,352,000 acres, while the area drained at that time did not amount to 1,500,000 acres. This,

however, refers to under or subsoil drainage, and it is not to be supposed that the undrained remainder of 21,300,000 acres would represent surfaces yielding malarial exhalations. But that great benefit to health would arise if that area were drained cannot be doubted. Now, where the subsoil of marshes or swamps is of a retentive character, either arterial or surface-water drains alone, as has been pointed out by Dr. Thornton, will not always be sufficient. The surfaces may be so flat that, in wet seasons, the water will rest on them without any chance of escape into the arterial drains.

In view of the importance of the subject, it will be worth while to describe the operations I referred to at the commencement of this paper, which have been recently carried out in the fens and marshes of Lincolnshire.\* In the marshes a fine system of arterial drainage exists, and, therefore, no difficulty arose as to outfalls. But, as I have already remarked, the soil being close and retentive, with a very flat surface, and with fields measuring perhaps 100 acres or more without any drain or ditch, the water, in wet seasons, lay for months, thus reducing large and highly cultivated areas to the condition of swamps.

The subsoil of the fens is quite distinct from that of the marshes. That of the fens in which the work was carried out consists of stiff dark brown and blue alluvial deposit, with some beds of black earth or peat, and here and there beds of silt, which form small knolls, one or two feet high, above the surrounding land. The subsoil of the marshes, however, is formed of silt or sandy deposits more or less consolidated, and originally brought in by the sea, containing layers of decayed vegetation which has grown and perished under each successive accumulation of sand.

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\* It may be observed that arterial drainage can only be applied to suit the circumstances of the particular case, while agricultural or subsoil drainage is similar in its character wherever adopted, although its adaptation to various soils requires discrimination.



The wet seasons, which lasted without intermission from 1875 to 1883, inclusive, reduced a large part of these fens and marshes to the condition of swamps. Ploughing and sowing could be carried on only with the greatest difficulty, and a large part of the crops was frequently lost, while the pasture lands greatly deteriorated.

In the fens, open drains already existed which afforded outlets for pipe drains. In the marshes, it was found necessary to divide the field into smaller areas by cutting large arterial drains, with a level bottom about 5 ft. below the surface of the land. By this means it was found possible to give an artificial fall in the absence of any natural one. In this way efficient drainage became practicable, although, owing to the slightness of the falls, extreme care was necessary in laying the pipes.

In the fens, the main pipes were laid about 3 ft. below the surface, with the small fall of about 1 in 2,000, and the minor pipe-drains at an inclination of about 1 in 1,600. In order to insure accuracy in cutting the bottoms of the trenches for the pipes, the water in the open drains was dammed up into them before any pipes were laid. When the bottom had been proved, the main pipes, which were larger than would be used in ordinary pipe drainage, were laid, and the minor pipes were connected with them in the usual way. Where the subsoil was alluvial deposit, and the surface level was irregular, the drains were laid in the "hollows" or "lows"; where it was flat, they were laid at distances of 24 and 27 ft. apart; while the depths varied from 2 to 3 ft., the greatest obtainable.

In the marshes the main arterial drains generally discharge fairly the water that comes to them. In excessively wet seasons, however, owing to the deficiency of open ditches and of pipe drainage, the water could not, for a long time reach them, and the land was meanwhile almost submerged. The outlets of the main pipe drains were laid 3 ft. 6 in. to 3 ft. 9 in.

deep below the surface, and with a nearly level bottom. The main pipes were laid in a similar manner to that in the fens. The widths apart, however, between the minor drains, varied from 36 to 66 ft., according to the stiffness of the subsoil.

The cost of pipe-draining the fens varied from £3 16s. 3d. per acre to £5 10s. 10d., and the marshes from £2 16s. 1d. to £3 0s. 9d. per acre.

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### FACTORY AND WORKSHOP ACTS.— LISTS OF OUTWORKERS.\*

By Dr. T. ORME DUDFIELD, Medical Officer of  
Health for Kensington.

THE Local Government Board have recently brought under the notice of the several sanitary authorities an Order which has recently been issued by the Home Secretary under the Factory and Workshop Acts, requiring lists to be kept of outworkers in the following businesses, viz. :—

The manufacture of articles of wearing apparel.

Cabinet and furniture-making and upholstery work.

The manufacture of electro-plate.

The manufacture of files.

The Order, made under section 65 of the Act of 1878, and section 27 of the Act of 1891, requires "the occupier of every factory and workshop, . . . and every contractor employed by any such occupier in any of the businesses mentioned, . . . to keep lists showing the names of all persons directly employed by him, either as workman or as contractor, in the said business, outside the factory or workshop and the places where they are employed." Such lists are to be open to inspection by any factory inspector, or by any officer of a sanitary authority.

The Local Government Board, in the circular letter accompanying the Order, state that

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\* Extracted from Report made to the Kensington Vestry.

the Secretary of State "considers it of great importance that all practicable means should be taken to make known this Order to all those who have to comply with it, or are affected thereby. He is anxious that the sanitary authorities should give full publicity to the Order in their districts, and follow it up by active steps for the inspection of the workshops and houses in which the outworkers are employed, in order that full effect may be given to the object which Parliament had in view when passing the enactment under which the Order is issued." They, moreover, express their "trust that the sanitary authority will co-operate in this matter to the utmost of their power." They state that the sanitary authority "should at once take measures to secure that the Order is made known to those whom it affects, and that the medical officer of health and the sanitary inspectors should be instructed, from time to time, to examine the lists, so that they may become aware of the places in which outworkers in the trades in question are employed." They add that it is "especially desirable that frequent inspection should be made of these places, so that prompt measures may be taken to deal with any sanitary evils existing in them."

The first duty that would appear to devolve upon the sanitary authority under this Order is, to secure for it that "full publicity" which the Secretary of State desires, and which might be attained forthwith, by advertisement in the local newspapers, by the circulation of handbills, and by search of directories for the names of occupiers of factories and workshops, whom the Order is likely to affect. It is noteworthy that neither the Acts nor the Order require such occupiers to make themselves known to the sanitary authority. A list of occupiers of factories and workshops, as complete as possible, having been made, a copy of the Order might properly be sent to each occupier, with a request that the necessary list of outworkers should be prepared forthwith, showing the places where they are employed, whether such outworkers are employed

by the occupier directly or by any contractor employed by him.

It is to be noted that sanitary officials do not appear to have any power of initiative under the Order. The Local Government Board desire the co-operation of sanitary authorities, whose officers, they say, "should be instructed from time to time to examine the lists, so that they may become aware of the places in which outworkers in the trades in question are employed."

It is not likely that there are many, if any, manufacturers of electro-plate or of files in this parish, and probably there are not very many outworkers in cabinet and furniture-making and upholstery work. But the number of outworkers employed in the manufacture of articles of wearing apparel is, no doubt, considerable. It is obvious, moreover, that the danger of the spread of infectious disease through the medium of clothing manufactured by outworkers is one not to be disregarded, having respect to the limited domestic accommodation usually possessed by such persons; and assuredly it is desirable that the places where they carry on their avocation should be known to the sanitary authority, so that "any sanitary evils existing in them" may be dealt with, and especially that work in them may be caused to cease at any time when infectious disease prevails in them—a fact which the sanitary authority are made acquainted with through the operation of the notification clauses of the Public Health Act. There should be co-operation between sanitary officials throughout the Metropolis in carrying out the duties devolved upon them by sanitary authorities, so that names and addresses of outworkers, not residing in the parish or district in which the factory or workshop is situated, may be communicated to the medical officer of health of the parish or district in which such outworkers reside.

But for the purpose of giving that "full effect . . . to the object which Parliament had in view when passing the enactment under which the Order is issued," which the Local Govern-



ment Board state the Home Secretary is anxious to secure, the machinery provided by the Act is quite ineffective, and the sooner it is amended the better in the interests of public health. Provision should be made so that occupiers of workshops, and their under-contractors, should be required to send periodical lists of their outworkers to the sanitary authority, whose proper duty, of inspection of the places where the said outworkers live, would then begin. Given a sufficient staff, there would be no difficulty in making "frequent inspection" of the said "places," in order to measures being taken "to deal with any sanitary evils existing in them." But any present attempt to carry out the "law," as comprised in the Act and the Order, will, I fear, end in failure, and I think it would be well to intimate to the Local Government Board and the Home Secretary that the Order, in the present state of the law, imposes on sanitary authorities an almost impracticable duty.

It will not be altogether out of place here to mention that the Factory Acts, as I pointed out in my eleventh monthly report for 1891 (November 9th, page 140), impose a variety of duties upon sanitary authorities, to which practically little effect has been given hitherto. It would be well, therefore, that the list of occupiers of factories and workshops, requisite for giving effect to the Order, should be extended so as to include the occupiers of all such workshops and work places as it is the duty of the sanitary authority to inspect, where work is done exclusively on the premises, and which obviously should be inspected in the interests of the occupiers themselves, as well as of the *employés* and of the public health. It is hardly necessary to observe, having regard to the definition of the expression, "workshop," in section 93 of the Act of 1878, that the work thus foreshadowed would be considerable, and could not be done effectually without material interference with the current work of inspection of dwelling-houses, unless local inspectors of factories and

workshops should be appointed, to whom might be delegated the duties devolved upon the sanitary authorities by the Smoke Consumption clauses of the Public Health Act, which at present are practically in abeyance.

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### THE CLAIMS OF SANITARY SCIENCE UPON THE CLERGY.\*

By the Rev. C. G. K. GILLESPIE, A.K.C., Hon. Chaplain, Derby Infectious Diseases Hospital.

IT is common for those who reject our message concerning spiritual things to refer us or their associates to matters of common life, and with some confidence to ask what we have ever done to improve the practical conditions in which those live to whose vicious or careless courses we object. A ready answer is at hand in the enumeration of the many and various organisations existing in most town and many country parishes. A glance at a summary shows beyond further question that the Church is still, as long ago, helping the people to education, thrift, recreation, and medical care—these being matters in which her ready help is accessible by all; cases of special and individual need being indeed fully cared for, but excluded from present regard as individual rather than general in character. It is true that in many parishes large numbers of residents are periodically if not chronically destitute, and helped by Church alms; but it is urged by some who have escaped this condition that as a class they are outside all help from the Church, though help is needed before they can, if they will, recognise her teaching or her existence as beneficial. I propose to show not merely that this argument contains a strong element of truth, but also that it can be met by means within the reach of every clergyman visiting regularly, who is willing to follow a course of accurate but not severe study in physical science, to apply its results in daily

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\* A paper read before the Derby Clerical Society.

observation, and to formulate a systematic record of the phenomena under his constant notice.

For certainly thirty years the moral conditions of life in what are called the slums have taxed the patient earnestness of clergy and lay-workers. Shining examples of escape from the influence of filthy and degrading surroundings are recorded for their encouragement. But the slums remain, and, when deserted by those reclaimed, are with peculiar rapidity tenanted by members of the lower order of occupants. But, unhappily, there exist many other reasons for removal than that suggested as availing in a few cases, by comparison. Some are legitimate—as the search for work, a fruitful cause among the labouring class. But the owners of slum property fare badly at the hands of certain nomadic sections, who deal with landlord and doctor as convenient channels of gratuitous benefaction, extorted without scruple, and received without gratitude. It is usually from this class that the most frequent and persistent appeals for gifts come to the clergy, and it is in this class also that the charge of neglect is most frequently found to originate. We have all become accustomed to this, and have ceased to care much about the slander, as coming from such sources. But we have to look for the causes of a moral perversion so widely spread that some respectable people believe the false report, and point to the condition of the squalid homes as evidence of our neglect. Again, we not rarely observe that a family of more decent appearance comes into a house left by worthless tenants, and, after some faint attempts to put better conditions on foot, sinks to the local level of health and morals. One of the questions I propose to consider refers to the reasons for this decadence, the conditions which would prevent it, and the part we may effectively take in the introduction of such conditions, by direct personal influence based on unquestionable scientific observation.

Taking a typical district, I note first the sallow complexion generally prevailing, and the

dull lassitude which seems characteristic of the place rather than of families or individuals. Early or late, the people seem tired and the children play as if old before their time. In conversation, they seem sensible but apathetic, and rather from sheer lack of interest in anything than from love of dissipation, there is a general habit of tipping. Some gentle talk to a wife is attempted; she pleads that it is useless to try to make the place clean, because, if she does, nothing will make it sweet with a cesspool at the back door. Why does she not speak to the landlord? Well, she did once; but you see, if she said too much they might have to shift, and it's near for her husband's work. I talk to the man, who frankly says that he is not much at home, and though the place is rather in a mess, he gets his meals and goes out, and leaves all those things to the missus. I give a quiet hint in the right quarter, and the cesspool arrangement is revised. This gives me the opportunity to show these people that my interest has a practical side tending to actual effect on their behalf, and helps me to recognition as a friend helping them to help themselves; and this relation will not militate against my possible influence in higher things, while it gives the plea for cleanliness more chance of success. Another house, comparatively well kept, is never free from bad smells. The back door is accounted easier than the slopstone for the casting out of fluid refuse; in fact, the slopstone is neatly covered with clean boards, on which the bread, milk, and other provisions are kept. Here is the secret of the evil smell, and of much discomfort and injury to health. The sink trap is dry, and, worse, that of the drain is in the same state from disuse, and the end of the slopstone pipe is directly over the source of sewer gas. By a simple remedy within doors, the enemy is at least kept out of the house for the present; and a note is made for a hint to the builder and the plumber. A case of diphtheria in the parish was notified under the Act, and reported to me under my usual agreement with



the Sanitary Officers, who are always most helpful. Already the water had been suspected. I happened to know, from my own visitation, that illness of typhoidal or of diphtheritic tendency had recently appeared in every house in the row. This I reported in turn, and within a week the polluted well was replaced by the town's water. I cautioned the mother of the sick child against kissing her, and against allowing the little ones to sit beside each other. The mother escaped (narrowly) with a sore throat, and the second child altogether. In another case, scarlet fever of a malignant type caused the deaths of a boy and his mother. The father allowed no one to enter, and did all he knew to carry out the instructions of the Sanitary Inspector, who, in that rural district, visited the neighbourhood as efficiently as he could. But I was there more frequently, and I ascertained that the poor man had not thought of disinfecting the slops from the house, or even those from the sick room of the other son, still down with the fever. They were emptied into an open ditch-brook, having a slow westward current. Noting the S.E. wind then prevailing, it was not difficult to warn the Medical Officer as to the houses threatened. In one of those thus indicated two fatal cases occurred; another, earlier taken in hand, had a milder case; and beyond that point the precautions taken were successful in checking the progress of infection, after eight fatal cases, all traced to one common origin.

Fifteen years ago, when the Public Health Acts were less than a year old, a still more gruesome experience occurred. My crowded East London district was visited by an epidemic of small-pox of the worst kind. The Medical and Sanitary Officers had their headquarters four miles away. I distributed disinfectants on each side of each infected house, and ordered off all visitors, disinfecting the rooms myself where no intelligent person could be found in the family to do it. In one house there were six cases from first to last, one proving fatal. By the devoted Christian heroism of a poor neigh-

bour, loyally obedient to directions, at least two other threatened lives were saved. This woman, with the full sanction of her husband, a dock labourer, left her home daily in her daughter's care, going to the infected house in the fearless spirit of one who had learned all sides of a sacred duty and was prepared to fulfil it in a strength not her own. That the precautions in this exceptional case were of the most stringent character will easily be understood, and it is not difficult to imagine some hearer forgetting the vital extremity of the need in condemnation of the supposed risk. It is enough, perhaps, to note that no other case occurred in that street.

The instances I have given, and others to follow, are all from direct experience. They tend, I think, to show that there is at least opportunity for observation, and for such effort as may be judicious, in the ordinary round of our work. More than this, there are warnings with regard to the conveyance of infection. It is not necessary to say much as to any risk to ourselves. No clergyman troubles himself much about that, when the call for his ministrations comes. But to court dangers not really inherent in duty, which may be averted by the simple use of scientific knowledge scarcely more than elementary, is condemned by the fact that such knowledge exists. There is no selfishness in seeking to preserve for our sacred work the powers by which we may take consolation and strength to many more after the one from whose sickroom we might, but for such care, receive and even convey a fatal infection. Two cases out of several may here be cited. A young and zealous clergyman, whose early promise gave hopes of much usefulness, protracted his frequent visits to a small-pox patient, without sufficient precaution, took the disease and died; a Christian hero, indeed, but who might have fought many more battles for the Master whom he served. Another personal friend, soon after his appointment to a country living, had the grief of seeing one of his best Church helpers struck down with glanders from a horse. In

his sorrow and solicitude, he undertook much of the sickroom care, denying himself both rest and food to such an extent that for months after the patient's death he was himself an invalid with symptoms akin to those of blood poisoning. Noble and touching as such instances are, there is room for heroism as great in the life of the man who both counts the cost and husbands his resources : going about his work " with his life in his hand," as the saying goes—that is, knowing that his life, which belongs to God, has been entrusted to him to be used to the full in bearing witness to the sick and strong of the wisdom and love of our Father. Such a man should be sufficiently well-informed and wise to guard himself and any helpers in his work of mercy, if only that their efficiency may be the longer maintained.

I may seem to have travelled far from our slum itself, while giving examples from within it. We will return to consider its structural characters. Of course there are many forms, varying according to the shape, size, and levels of the site. First, as oldest, the back-to-back house, sometimes built singly, with more or less free space in front, but no opening behind for air or light. The essential evil here is the practical impossibility of ventilation except by diffusion, a process in most cases too slow for health. The sitting room, in cold weather, has the slit under the door carefully made air-tight, as nearly as possible ; the window, under which is the couch, being carefully shut at bottom by the tenant, the upper sash fixed by the builder. The fire will not burn unless made unduly large. Do what they can, they tell you, they cannot keep out the draughts. The poor old grandmother lies on the sofa-bed with the bronchitis and her daughter thinks she is going to be ill, her head aches so badly ; the children all have colds, and they get kept in for their lessons ; to say nothing of the smoky chimney, to which its proverbial concomitant is too often added. You observe that much of the fire is coked, and you note the blue flame of the poisonous carbon

monoxide. Here the cold current from the window is not through a leak, but the rebound of air chilled by the glass. A shawl in place of the blind checks that, and a little explanation shows that the fresh air may enter harmlessly if diverted in its course towards the fire by a low screen made of some old newspapers if nothing better is at hand. By the late Dr. Hinckes Bird's plan, lifting the bottom sash four or five inches and filling the gap with a board, or even a folded shawl or bit of carpet tacked on, an upward current of fresh air can be secured, which will diffuse through the middle of the window without a draught ; and the cold current from the window will be lessened by the better circulation of the air in the room. When, as very frequently is the case, the sick person is upstairs, this device, which I have frequently applied, is still more desirable. In that room are collected not only the products of the sick person's life, but the united vapours of the common life, heat, and lighting of the family. If there is one sanitary fact more neglected than any other it is probably this ; and if one chemical fact is more widely known than another, it is probably that carbon dioxide (carbonic acid gas) is heavier than air. True, if at the same temperature ; but when volatilised by heat, its constant condition under these circumstances, it becomes much lighter, and accumulates in layers from the top. This is one of the chief causes of the physical depression which sends many to drink and to consumption. In cases of overcrowding in dirty houses, these conditions tend to typhus, of which many cases were sometimes concurrent in parishes I have intimately known, from infection of a class I will presently describe. In all houses of this construction, a great reform can be effected at a small cost by the insertion of a simple ventilator at the top of each room. This calls upon another side of our possible influence, to be referred to later.

Many old houses, having cellars, are found on inspection to be heavily charged with damp, often itself charged with sewage matter. I have



known many cellars, some even used till recently and some even now as dwellings, having the floors periodically soaked with leakage from middens and like receptacles, either faulty in construction or decayed. In such places are the special centres of typhoid fever and its congeners. With regard to this disease, it is important to note that its infection, though of a mechanical character, is a real danger. The conditions which produce it in a resident may, as I have the saddest cause to know, when the disease itself is present, infect a visitor who is susceptible. I have known houses which, for many months, were never free from this scourge, the causes of which were known and removable. In reference to visitors and their danger to themselves and others, some very distressing instances will probably occur to most of us. One very important part of our work, as I take it, is to use all possible influence with the immediate friends tending the sick, to guard against the stupid and mischievous kindness which crowds the infected house, and even the sick room, with gossiping intruders who may be, and often to my knowledge have been, messengers of death to their own or other homes. A little girl whose baby brother had died of measles was taken, without any attempt or even thought of disinfection, into a neighbouring house, in mere pity for her loneliness; and within a fortnight the kindly but ignorant neighbour saw two of her own little ones die. It is strongly to be desired that the Act for the Compulsory Notification of Infectious Diseases may be not only adopted throughout the kingdom, but be accompanied, as on the Continent, by a notice on the house in which such disease is found. In Holland, where the government is as nearly republican as it can be without its actual proclamation, no one thinks the liberty of the citizen assailed by this. The people are trained to dread infection with, in some cases, a fear which might seem to us unreasonable. But they have their reward in the fact that direct communication of such disease is practically unknown.

*(To be continued.)*

## THE POOR LAW: ITS HISTORY, ITS SCOPE, AND ITS ADMINISTRATION.

THE question of dealing with that unfortunate section of the community which is reduced to such an abject condition of poverty as to become dependent upon others for their daily means of subsistence, is one of the greatest importance, whether considered from the social, the economic, or the hygienic point of view. Proofs of the correctness, now as when it was first uttered, of the Scriptural axiom, that the poor are always with us, are far too much in evidence whenever, after the fashion of Dr. Watts, "we take our walks abroad"; and it is a serious problem—we might, indeed, say it is yearly becoming a more serious problem—how to deal with pauperism; how to relieve it without pinching still more the hard-set ratepayers; how to assist the really deserving indigent without putting a premium on laziness and loafing.

We have lately perused an excellent pamphlet on this subject, which is full of interesting information and valuable suggestions. It is entitled "A Memorandum on the Poor Law and its Administration," and is the conjoint work of Mr. Harry Wilkins, Clerk to the Vestry of St. James, Westminster, and of the Earl of Wemyss (better known to our older readers as Lord Elcho), who is a member of the same Vestry.

Although the present Poor Law Act dates back only to 1834, Parliament has for the past five hundred years endeavoured to cope with pauperism. In 1388 (Richard II.'s reign), as Lord Wemyss informs us, the first Act was passed, and subsequent measures were from time to time introduced, until, in the forty-third year of Queen Elizabeth's reign (1601), an Act was passed, entitled "An Act for the Relief of the Poor," constituting the basis on which our Poor Law system now rests. Of course, in the days when all punishments were dealt out with a heavy hand, and when popular notions were

so crude and hazy that lunatics were whipped at periods—pretty frequent periods, too—under the impression that was the best way to cure the crazed creatures, our readers may rest assured that the Poor Law of those times had a preponderating amount of the penal in its composition. But, then, the enactments were directed chiefly to the suppression of vagrants and professional beggars. As with that arch rogue, Autolycus, in Shakespeare's "Winter Tale," it was often their occupation to steal as well as to beg. In the case of poor mendicants unable to work, they were limited to the places where they had resided for three years—this seems to be the origin of modern Poor Law settlement; if they ventured beyond the limits assigned to them, they were placed in the stocks for two days and two nights. As for able-bodied beggars, their fate, when "nabbed" by the parish constable, was to be whipped, sent back to their previous place of residence, and compelled to labour. But, after the dissolution of the monasteries by Henry VIII., the crowd of wanderers, who had previously been, to a large extent, relieved by the great ecclesiastic establishments, became a more serious public nuisance, and it was felt expedient to adopt stringent steps for their suppression. It was enacted that a "sturdy beggar" should be whipped for the first offence, his right ear cropped for the second, and, if a third offence should be proved against him at sessions (the charge being "loitering and idleness"), he was liable to be executed, as a felon and enemy to the commonweal. Branding on the shoulder with a V, for "vagabond," and being treated as slaves for two years, was the punishment under another Act of Parliament; and if they ran away before the two years had expired, they were, when caught, branded with the letter S (for "slave") on the cheek, and adjudged slaves for life. Boring the ears with red-hot irons was another penalty that was enforced.

The statute, 43rd Elizabeth, already referred to, enacted that overseers of the poor, with the

consent of two justices of the peace, should make provision for setting to work all persons having no means of maintenance, and using no ordinary employment to earn their living; also the children of persons unable to maintain their children; to raise by taxation a sufficient stock of flax, hemp, wool, and other materials for employing the poor on, as well as for providing funds to relieve the impotent, lame, and blind, the old, and others unable to work. Justices of the peace were directed to send to the House of Correction all who would not work, though able to do so. Places were to be provided for the poor and helpless. Provision was also made for compelling the parents or grandparents of every person unable to work, to maintain such person, if in a position to do so; and similarly as regards the children, when grown up and able, maintaining their parents. It is a somewhat curious thing that only relationship in a direct line, *i.e.*, up or down, has always been the basis of compulsory maintenance; brothers and sisters, for instance, are not liable for the charge of supporting indigent brothers or sisters.

So matters went on for nearly two and a half centuries, until, in 1832, the administration of the Poor Law had become so lax, and so burdened with abuses, that a Royal Commission was issued to inquire into the whole subject. It will interest our sanitarian readers to know that a prominent member of the Commission was the eminent sanitary reformer, Edwin Chadwick.

After two years' careful and minute inquiry, with the aid of sub-commissioners, the Commission reported that in the greater part of the districts into the condition of which they had examined—"the fund which the 43rd Elizabeth directed to be employed in setting to work children and persons capable of labour, but using no daily trade, and in the necessary relief of the impotent, is applied to purposes opposed to the letter, and still more to the spirit, of that law, and destructive to the morals of the most numerous class, and to the welfare of all." Certainly this was a sweeping condemnation.



Another paragraph stated that "the great source of abuse is the out-door relief (in kind or in money) afforded to the able-bodied on their own account, or on that of their families."

The statements of facts which were brought out in evidence fully confirmed the conclusions at which the Commissioners arrived. The able-bodied pauper, the stay-at-home loafer, who had taken the place of Henry VIII.'s "sturdy vagabonds," was virtually swallowing up almost every penny collected for the relief of the poor, just as our country readers may have noticed, during the late wintry weather, three or four ruffian starlings amongst a crowd of half-starved little birds—robins, sparrows, wrens, and finches—on the garden path, thrusting the helpless ones unceremoniously aside, and greedily devouring all the crumbs thrown out for the sustenance of the feathered community.

In an immense number of cases, labourers had their rents paid out of the Parish Fund, thus making paupers a desirable class of tenants, more so than the independent labourers, whose rent was really enhanced by this general practice. One man in Suffolk, for instance, a baker, had his rent, £13 a year, paid by the parish, with an additional grant of half-a-crown weekly on account of his family. Relief from the parish in aid of wages was styled "allowance" or "bread-money"; and under a system called "Roundsmen," the parish paid farmers to employ applicants for relief, at the rate of wages fixed by the parish—such wages calculated not on the services rendered by, but on the wants of, the applicants—the employer being repaid all he advanced for wages beyond a certain sum. In the Vale of Taunton, all farm labourers thus received, indirectly, a portion of their wages out of the Poor Rate, during the whole or greater part of the year. At Yardley Hastings, a Northamptonshire village, all unemployed labourers were put up for sale weekly, and the clergyman of the parish stated in evidence that, on one occasion, he had seen ten men let to one of the farmers for 5s.

for the week. We can remember, in our early boyhood, hearing of a similar condition of things at Southam, a small town in the adjacent county, Warwickshire. The local farmers used to meet—we believe it was in the vestry of the parish church—and proceed with the letting of unemployed able-bodied labourers as systematically as the lower-class London brokers do with a "knock-out" at an auction.

We may remark, parenthetically, that a somewhat identical, though more inhuman, system obtains at the present day in Finland, where a sort of district sale of the indigent poor is held annually, the "farmer" (in more senses than one) agreeing to pay a certain sum of money to the local fund for the services of the person he buys for the year, not having to pay any wages, but merely undertaking to house (in any hovel), to feed (with any scraps), and to clothe (in any rags) the wretched human chattel placed at his absolute mercy for the next twelve months. "Scratch the Russian and you will find the Tartar" is a proverbial saying, having reference to the frequency with which Russians, when the veneer of civilisation is rubbed off, display a semi-barbarian state beneath the surface. Take away from this Finnish custom the flimsy pretence of letting or hiring, and what do we find but slavery in a considerable province of the Czar's empire?

But the able-bodied pauper in England, in the period preceding the new Poor Law Act, did not suffer like the Finnish pauper. He had too much of the sturdiness that made his class a sore trouble and difficulty to the authorities under the Tudor kings and queens, and turned the incompetence of the parish officials to his own advantage. He obstinately refused to work one tittle more than he thought fit, and, in consequence, an honest, hard-working labourer was placed at a disadvantage; his position relatively was analogous to that which the "mean white" in the United States held in the eyes of idle negroes after the Emancipation.

The outcome of the Poor Law Commission

was that a Poor Law Amendment Act was passed in 1834, directed to the remedy of the glaring evils exposed by the Commissioners; but abuses die hard, and, as Lord Wemyss observes, "the not unnatural result of this very stringent and radical reform of previous abuses of administration was a loud complaint of the hardship and injustice of the new system of giving relief." Accordingly, a Committee of the House of Commons was appointed in 1838 to inquire into the operation of the Act during the four years that it had been in operation. This Committee reported strongly in favour of the Act.

Mr. Wilkins draws attention to the fact that the Commissioners reported that the laxity of administration which led to the passing of the Poor Law Amendment Act, of 1834, had its rise, firstly, in Poor Law relief being administered by the overseers of the poor, who served only for one year, who were frequently unwilling to take office, and were still more unwilling to render themselves unpopular by rigid economy; and, secondly, in the circumstances that justices of the peace assumed a power of granting relief over the heads of the overseers. "It is thus clear that the laxity complained of arose from want of continuity of good system, and from overlapping jurisdiction. It is important to remember this at the present time, when there is, in some quarters, a tendency, due to the most praiseworthy motives, to relax those precautions in the administration of the Poor Law which experience has justified, and to look to municipal bodies to partially take the place of recognised Poor Law administrators." He points out that the passing of the Poor Law Amendment Act was followed by a remarkable immediate and progressive diminution of pauperism.

"The main lesson applicable to present circumstances, to be learned from the history of pauperism and the Poor Law in this country," says Mr. Wilkins, "is the self-evident fact that interference with natural economic laws has a tendency to prolong or intensify the very

evil which it is desired to remove." He admits one inherent defect in the existing Poor Law system—namely, that its administration is apt to become mechanical or stereotyped. As to "relief works," often suggested as a remedy for temporary distress, meaning thereby works begun at an earlier period than was at first intended, or which, but for prevalent distress, would not have been commenced at all, Mr. Wilkins rightly describes them as "usually nothing more than a draft on the future." Funds are absorbed which would, in the ordinary course, have been expended later, and thus the balance of demand and supply is liable to disturbance at some later period. In short, as Mr. Wilkins tersely sums up, "the artificial creation of labour can never provide a permanent remedy for want of employment." W. A.

## THE ACTION OF WATER ON LEAD.

By J. H. GARRETT, M.D., D.P.H.

THE subject of the action of water on lead has a special hygienic interest on account of its resulting in the contamination of drinking-water by lead.

In the Gulstonian Lectures, delivered before the Royal College of Physicians of London, Dr. Thomas Oliver treated the subject of lead poisoning in an exhaustive manner; and to his treatise reference can be made for information upon the pathological effects likely to accrue from imbibition of this metal and its salts.

The chemical aspect of the question has received the attention of several experimenters, but the want of agreement noticeable in their results has led to a confusion, rather than a settlement, of the matter. I venture to suggest that this has been mainly due to the different ways in which the experiments have been conducted, and to the bias in favour of the belief that the acid, which is sometimes contained in mineral waters that act on lead, is in some way the cause of the action.



By the observations I have made upon the action of a great many waters, I am convinced, and cannot think there is room for doubt, that the primary action of water on lead is, in every case, a process of oxidation. Thus, the invariable result of putting lead into contact with water neutral or faintly alkaline in reaction, such as most distilled waters, is the production of a colourless crystalline oxyhydrate of lead that is almost insoluble in pure water. I have had under observation numerous samples of soft waters from the Devonshire rivers, &c., and have found that they act upon lead in a manner practically identical with the action of distilled water; and a similar effect may commonly be obtained from rain-water. In each case solid oxyhydrate of lead is rapidly produced, and falls off the lead as it is formed, leaving a fresh surface to be acted upon. The air being admitted to the surface of the water, this action is continuous, lasting for weeks or months, or until the lead is buried in the deep layer of oxyhydrate produced.

With the action of these neutral or faintly alkaline waters, let us contrast the action of a decidedly acid water. Naturally acid waters are found in connection with peat and otherwise, but the composition of the acid which these peat waters contain is at present unknown. When one of these acid waters is placed in contact with lead we get a clear solution of lead salt as an immediate result; but, doubtless, the lead is oxidised before being dissolved by the acid. The amount of acid present, of course, determines the amount of lead that can be dissolved. The action does not necessarily stop here, however, but the oxidation of the lead may continue beyond the point of saturation of the acid, and the extra oxide formed, or a part of it, combining with the neutral salt in solution, forms an oxysalt. This oxysalt being less soluble than the neutral salt, less lead is now contained in solution; a portion of that at first dissolved now forming part of the deposit that lies upon the bottom of the vessel, or upon the

surface of the lead. When the acid in the water is very small in quantity, the usual production of oxyhydrate of lead is only delayed for a short time. When a much more appreciable quantity of acid is contained in the water, the oxysalt which is thrown out of solution and deposited, or formed, upon the surface of the lead, tends to adhere firmly, and covering the lead, protects it, and thus brings the action to a termination. By a very careful neutralisation of the acid, the production of solid oxyhydrate may be made to commence immediately, just as it does in waters that are naturally neutral or nearly so. The oxyhydrate of lead itself gives the water an alkaline reaction, and the reaction of every water that is acting on lead is therefore destined to become alkaline ultimately, the only factor necessary for the continuous oxidation of the lead being a constant supply of oxygen.

Waters which are decidedly alkaline, by reason of containing a considerable quantity of carbonate, such as calcium carbonate, including those that deserve in any degree the title of hard waters, are prevented from acting on lead by the formation upon the surface of the metal of a closely fitting insoluble coat or film, which is presumably a basic carbonate of lead. The carbonic acid which ordinarily acts as a solvent to the carbonate of lime in hard waters does not leave the carbonate of lime to dissolve carbonate of lead; but unusual waters may exist in which there is a very large excess of carbonic acid gas over that required to hold in solution the calcium carbonate, and the formation and solution of carbonate of lead may then be expected. Such a water must be included amongst the acid waters, and there is no acid water that so well exemplifies the effect of the continued oxidation at the surface of the lead, in causing the ultimate precipitation of the soluble lead salt at first formed, as distilled water into which carbonic acid gas has been passed.

It has been stated by some authors that

carbonic acid gas dissolves lead, by others that it coats lead and prevents the action of the water upon the metal. It does both; first the one, and then the other. For carbonate of lead is first dissolved by excess of carbonic acid; but this excess of carbonic acid is presently neutralised by further production of oxide of lead. A great part of the lead at first dissolved is withdrawn from solution, and a basic carbonate is formed upon the surface of the lead which, protecting it from the water, causes cessation of action. The coat which carbonic acid gives to lead in this way is a soft white fur, quite different from the closely fitting film that is formed upon it when an alkaline carbonate is contained in the water. A fur similar in appearance, composed of basic salt, covers the lead as an ultimate result of the action of waters containing other acids, such as nitric, hydrochloric, or sulphuric, which, in limited quantities, have been purposely added to the water, or the acid naturally contained in peaty waters when it exists in them in sufficient quantity. The fact of a water containing certain neutral salts other than carbonate, such as sulphate, also leads to the formation of a similar fur upon the surface of the lead, a reaction between the oxyhydrate of lead and the sulphate of calcium, &c., evidently taking place. The presence of sulphate, chloride, &c., causes more lead to be retained in solution, and ammonia salts do the same thing in a certain particular degree, especially nitrate of ammonia. Sulphate diminishes the rate of production of oxyhydrate of lead, or puts an end to its production altogether by clogging the surface of the lead with basic salt of slight solubility, that does not fall off the surface of the metal as do the fine crystals of the oxyhydrate itself. The presence of chloride appears to increase the rate of oxidation of lead. Phosphate and silicate have some power in causing a closely fitting insoluble film to be formed on the surface of the metal, which has influence in protecting it from further action of water; but the protective coat afforded by these salts does not form so quickly and per-

fectly as is the case with that formed by carbonate.

The rate of action of water on lead, whether the water be acid or faintly alkaline, is increased in a marked manner by increase of temperature, perhaps up to  $70^{\circ}$  C.; but above that temperature a comparatively slight and limited action takes place. In my experiments I have got the most marked results at about  $50^{\circ}$  C.

I am desirous of making plainly understood that it is in waters that are nearly neutral in reaction that the production of lead salt occurs with greatest rapidity and continues with the least interruptions; and lead may generally be found in such waters when they are conveyed through leaden pipes. It is not dissolved, but exists in a state of suspension. The minute crystals of oxyhydrate lend themselves very readily to suspension, and when suspended in a water may be easily overlooked, unless the water be critically examined in a good light. The lead, when existing in water in this condition, has no doubt sometimes been taken to be dissolved. The practical effects are much the same as if it were dissolved; but it is as well to make the distinction in considering the cause of the action of water on lead.

The action consisting primarily and chiefly in the oxidation of the metal, we are at the root of the matter when we begin to consider whence and how the oxygen is derived. What are the possible sources of oxygen? *a.* The free oxygen that is dissolved in the water. *b.* Oxygen that may be derived by decomposition of water, either by the lead itself displacing hydrogen, or by an electrolysis due to voltaic action resulting from the fact of common sheet and pipe lead being invariably alloyed with small quantities of other metals. *c.* Oxygen derived by reduction of the nitrates and nitrites, or other forms of oxidised nitrogenous matter, which occur in most waters to a greater or lesser extent.

If a water be obtained that has not the power of acting on lead, even though it contains no carbonate, &c., to obstruct the action (and such



a water is occasionally met with), no amount of aëration will cause the action to start, or increase it where it only occurs in a slight degree. If a distilled water, which has been found to act on lead in the cold with rapid and continuous production of oxyhydrate, be placed in a platinum dish and boiled for five minutes, we may take it for granted that the whole of the free oxygen is dissipated. Now if, without allowing the water to cease boiling, we drop in pieces of clean lead, there should be no lead salt formed provided the action is wholly due to free oxygen. But a limited, yet decided, quantity of lead salt is formed, giving the water an opalescence and a flocculent deposit. This initial action cannot be due to free oxygen. But if it be thus proved that action can take place when the absence of free oxygen is assured, it is quite as easy to prove that a *continuous* oxidation of the lead cannot take place unless air be admitted to the surface of the water. A water which acts on lead with production of oxyhydrate being placed in an appropriate vessel, along with pieces of clean lead, melted paraffin, wax, or oil is poured over the surface of the water, and the air is thus shut out; a check experiment is at the same time made with water and lead in the same proportions, but with the air freely admitted to the surface of the water. In the former, action occurs and proceeds for a time, and then abruptly comes to an end. In the latter, similar action occurs, and the two keep pace for a time equally with each other; but in this, the action continues after it has ceased in the other, so that at the end of a week the lead salt formed in it is vastly greater than that which has been formed in the one from which air is excluded. From this observation we are forced to the conclusion that whatever may be the initial cause of the action, the continuation of it beyond a certain point is certainly dependent upon absorption of oxygen from the air.

The fact of the action requiring for its continuance, but not for its commencement, a supply

of air, proves, of itself, that the action is not due to a decomposition of water, either by a simple displacement of hydrogen by lead, or by electric influence. Besides this, at common temperatures, the action of water on lead does not result in any evolution of hydrogen, and it would not be possible for decomposition of water to proceed for any length of time without hydrogen being evolved. In regard to the production of an electric current by reason of the impurity of the lead, samples of pure metal were found to have an action upon water precisely similar to the commercial metal.

It is a rare thing to meet with a water that is absolutely nitrate-free; and as lead reduces nitrate at common temperature when contained in solution in a water, however minute a proportion be present, we have here an undeniable source of oxygen. Every nearly neutral water that acts on lead, with production of crystals of oxyhydrate, and every naturally acid water that acts on lead with solution of the oxide, gives evidence of containing nitrate after the action has taken place. As the water did not contain nitrate in the first place, or if it contained nitrate the quantity is now increased, we are right in assuming that it has been produced by reduction of nitrate by the lead. In the hundreds of experiments that I have made upon the action of water on lead, in no case where the ordinary action has occurred have I failed to obtain ample proof of the presence of nitrate after the action. But although lead reduces nitrate to nitrite (and, when air is excluded, probably to hypernitrite), it never reduces it entirely to ammonia at common temperature. The reduction, apparently, does not take place with sufficient rapidity for this to happen, and, unless water be decomposed, there is no hydrogen to form ammonia with the nitrogen of the nitrate. When there is free admission of air, the nitrite is re-oxidised by the oxygen of the air as fast as it is reduced by the lead.

*The main action of water on lead is, therefore, due to the presence in the water of a nitrate (or*

*some partially oxidised organic nitrogenous compound which admits of being reduced by the lead and re-oxidised by the air, giving the reaction of nitrite when reduced).* The continuation of action observed to take place in a nearly neutral water, where oxyhydrate of lead is produced for weeks together, is due to acting as an oxygen carrier between the air and the lead. The rate of action is increased when copper, silver, and other metals are in contact with the lead beneath the water. The rate is diminished when zinc, tin, and other metals are similarly in contact with it, these metals suffering oxidation in preference to the lead.

### PUBLIC HEALTH REPORTS.

*Surbiton, Surrey.*—Although adjacent to the more populous district of Kingston-on-Thames, Surbiton, being a separate urban sanitary authority, is under the control of the Surbiton Improvement Commissioners. Judging by the fifteenth annual report of the medical officer of health, Dr. Owen Coleman, the sanitary condition is highly satisfactory, the death-rate being only 13·6 per 1,000 in a population exceeding 10,000. Of the 136 deaths registered, 29—about one in every five—were those of persons who had reached or passed their seventieth year. The zymotic death-rate was 1·1 per 1,000; while the birth-rate was 20·8 per 1,000 during the same period.

Although Surbiton fully maintains its reputation as one of the healthiest suburban districts near London, we are pleased to find that the authorities have not fallen into the mistake of becoming apathetic in respect of sanitary precautions, as is evidenced by the details given in Dr. Coleman's report.

*Kensington.*—Dr. Orme Dudfield, the indefatigable medical officer of health for this important metropolitan district, has included an annual summary of vital statistics for 1892 in his first monthly report for the present year.

The estimated population at the middle of 1892 was 166,700—viz., in the Kensington Town sub-district, 118,700, and in Brompton, 48,000. Out of this total number of inhabitants 65,800 were males, and 100,900 were females, a greater difference than ordinary (accountable for, perhaps, in some degree, by the circumstance that, as many of the 20,000 houses in Kensington are occupied by persons in good position, there were many women servants employed). The births certainly do not show any such marked numerical preponderance of one sex over the other, for the 3,718 births registered in 1892 consisted of 1,867 males and 1,851 females, making the birth-rate 22·3 per 1,000, as against 31·2 in all London.

The death-rate for the twelve months ending on December 31st last was 17·2, being 0·5 above the decennial average, although it was 3·6 below the death-rate of the whole metropolis for 1892—viz., 20·8 per 1,000. The mortality from the seven principal zymotic diseases were more numerous than in the previous year, making the zymotic death-rate 2 per 1,000, as against 1·6 in 1891. The zymotic death-rate for the whole of London during the same period was 2·8 per 1,000. The zymotic disease causing the greatest mortality was measles, 109 deaths being attributed to this cause; diarrhoea caused 77 deaths; next to these two ranks whooping-cough, 63 deaths from which were registered; scarlet fever produced 36 deaths, and diphtheria 31; fevers 17—viz., typhoid, 15; simple continued fever, 2; typhus, 0. The mortality from measles and scarlet fever was above the average, while that from diphtheria, whooping-cough, and fevers fell below it. There were no deaths from small-pox, and only one case of that disease was notified during the year. In speaking of deaths, it should be noted that fourteen deaths were returned as “not certified,” the deceased persons not having been attended in their last illness by any registered medical practitioner.

Is the notification of disease going out of fashion? We are led to ask this question



owing to the great falling off in the number of cases of infectious disease notified in the metropolis, a falling off almost too considerable to be accounted for by their temporary diminution. Thus, in the four weeks which ended on December 31st, the number of such cases notified was 3,737. The numbers notified in the corresponding weekly periods in the three previous years were 6,232, 5,973, and 4,742.

The Home Secretary has recently issued an important order with reference to the provisions of the Factory and Workshops Acts, requiring lists to be kept of outworkers in various businesses especially demanding sanitary supervision. Dr. Dudfield's remarks on this subject will be found in another part of the present number of HYGIENE.

## Reviews and Notices of Books.

*The Value of Hypnotism in Chronic Alcoholism.*

By C. Lloyd Tuckey, M.D. 57 pages.  
London: J. & A. Churchill. 1892.

WE confess that we took up this book with a certain amount of want of faith in treatment by hypnotism; but we are also bound, in fairness to the author, to admit that he has dealt with the question in a temperate, quiet, almost apologetic manner, calculated not only to disarm opposition, but to induce his readers at any rate to weigh dispassionately the merits and demerits of hypnotic methods in dealing with admittedly one of the most intractable of human infirmities.

Chronic alcoholism is not merely an ailment of multiple origin and character; it is, speaking broadly, a form of mental disease often arising from bodily illness, or weakness of the nervous system, its victims having gradually fallen a prey to the most besotting and degrading influences. In their sober moments they find, or they fancy, themselves the objects of suspicion and loathing on the part of relatives and friends;

they feel themselves disgraced and marked individuals; the helping hand is less frequently held out to them than the seductive glass; and whatever good resolutions they may have formed fade away with the rapidity of a mist dissipated by the morning sun. And so they go on from bad to worse—"Facilis descensus Averni"—till body or mind, or both, give way to the perpetual strain, and the end is—*Death*.

Surely, as Dr. Tuckey says, even those who have an undisguised dislike to hypnotic measures ought to put their objections on one side until it has been determined by sufficient scientific observations whether hypnotism is entitled to the praise which its adherents claim for it. A well-known medical temperance advocate and author, writing some time back on the subject, dismissed it almost contemptuously with the remark, "Better drunken liberty than sober slavery"—influenced to this view apparently by a sentimental objection to interference with free will, and to forcing people against their natural inclinations to become respectable and useful members of society. Such arguments scarcely accord with orations in favour of Local Option; and, if pushed to an extreme, they would as a logical deduction put an end to all attempts to reform criminals as well as habitual drunkards. Celsus, one of the oldest Roman writers on medical matters, laid down the axiom that "A man who is in good health, and a free man, ought not to bind himself down by any rules"; in other words, he should eat and drink when, how, and what it pleases him. But can the victim to chronic alcoholism be regarded by any stretch of the imagination as a healthy or a free man? It would be an idle waste of time to raise—much more, to argue—such an hypothesis.

Dr. Tuckey's book is, to a great extent, a reproduction of a paper which he read before the British Medical Association at Nottingham last year. A Committee had been previously appointed to investigate the question of hypnotism as a remedial agent, in consequence

of communications made by Dr. Tuckey and Dr. Kingsbury, of Blackpool, at the Birmingham meeting of the Association. This Committee has presented one report, which has been referred to it, and the Committee re-appointed for another year, during which period more exhaustive inquiries and experiments are to be made.

Dr. Tuckey is opposed to adding hypnotism to the already overcrowded list of specialities; and he does not recommend its employment in slight maladies amenable to ordinary treatment. In short, he would use it in suitable cases, just as he would employ massage or electricity where benefit might be reasonably expected. "While regarding hypnotism as a therapeutic agent of great efficacy in a number of intractable diseases and conditions dependent upon disordered innervation, defective nutrition, and perverted instincts," he observes, "I feel that the claims advanced by certain enthusiasts to make the scope of psycho-therapeutics practically co-extensive with the domain of medicine itself are calculated to cause scepticism and confusion." If Dr. Tuckey had substituted a shorter word—"quacks"—for "enthusiasts," he would not, in our opinion, have gone too far; while he would have practically stated the reason why a very large majority of medical men and of the thinking public regard hypnotism with distrust and suspicion.

Dr. Tuckey gives details of thirty-one cases of chronic alcoholism which he treated systematically by hypnotism in the three years 1889-91. In several of these favourable results were obtained, and he speaks very hopefully of the possible advantages that may be anticipated from a continuous trial of this remedial measure. But to be of value, it must, he says, be resorted to continuously and steadily, casual hypnotisation being almost valueless. A similar opinion might be advanced with regard to any form of treatment; but assuming, for the sake of argument, that hypnotisation will cure some cases of chronic alcoholism, as asserted by Dr.

Tuckey and others whose statements are worthy of attention, the fact is considerably discounted by the admission candidly made by Dr. Tuckey himself, that a great factor, as regards the probability of success, is the co-operation of the patient. Hypnotism, therefore, is merely a means to an end. If the drunkard is not so utterly lost as to be indifferent about whether he shakes off the drink-habit or not, then there is a chance for him. Looked at from this point of view, the hypnotisation may be considered as paving the way to so acting upon the individual's mind as to facilitate moral suasion, and thus to strengthen the will-power. "I believe," writes Dr. Tuckey, "that hypnotism very often enables us to effect moral reformation more speedily and better than any other means with which we are acquainted, but that it only enables us to bring to the surface what already exists" (*i.e.*, resolution and will-power). "If there exists such a thing as a man without any good in him, I am afraid hypnotism can do nothing for him." When Dr. Tuckey wrote in this somewhat pessimistic strain, he must have had in mind certain cases which he mentions in another part of his book, such as that of a lady who "actually went so far as to ask me if she might not have a glass of claret with her dinner, immediately I aroused her from a condition which corresponded with Liébeault's second degree of hypnosis"; or that of a chronic drunkard (a "medico," we regret to say) who, after being hypnotised to the fifth degree, "awoke in a few minutes in opposition to my suggestion that he should sleep for half an hour; I have no doubt but that he went to sleep with his mind full of mental reservations, and with a determination to offer opposition to my suggestions. I learned that he went almost straight from my house to a tavern, and though I hypnotised him on two or three occasions, I could never induce a dislike for alcohol or a *desire for reformation*."

We have ourselves italicised the last three words of this quotation, not in any carping spirit, but as furnishing, in our mind, the key-



note of all successful treatment of inebriates, be the plan adopted what it may. If the victim of chronic alcoholism shows a *genuine* desire for reformation; if that desire comes as an effort of strong will and determination, and not as a mere spasmodic, plaintive wish, there is good ground for anticipating satisfactory results from continuous measures and careful watching. There are two important factors which must not be overlooked—viz., to improve the condition of bodily and mental health, and to give the individual proper occupation, so that the time shall not hang heavily upon his hands. We were greatly struck with these facts some years ago, when we visited an institution for the cure of inebriates, situated at Heimdal, near Tönsberg, in Norway, and contrasted the management there with that which is permitted to prevail at one English institution with which we happen to be acquainted. In the Norwegian establishment, every inmate was told off daily, after breakfast, to some occupation, generally in the open air, or if the weather proved unfavourable, in roomy, well-fitted workshops, that would last up to the dinner hour (2 p.m.). In the afternoon it was customary to seek some out-door amusements, of which there were a variety, as the château stood in the centre of the estate in the open country, at the head of a picturesque fjord, or lake, which extended several miles, affording unlimited facilities for boating, swimming, and fishing. One patient, treated at this institution, had been for twelve months at the English retreat already referred to without deriving any benefit whatever; yet, in a shorter period, at Heimdal, he became a totally changed man. When I last saw him, I visited his house, and stayed for some time there with him and his happy family; he was then, and I believe that he is still, a total abstainer, and a prosperous and respected merchant, in an extensive way of business. The inmates of the English institution were allowed to wander about the small town where it was located, or to adjacent large towns, where unlimited facilities

existed for getting intoxicants. Evidently the manager was too much absorbed in the financial part of his duties, or he had not learned what Dr. Tuckey tells us certain cases told him—viz., “the important lesson of never trusting a drunkard’s word, unless every security is given that deception is impossible.”

As regards inebriate homes we should be reluctant to say a word against them, provided that they were well managed, as doubtless the chief proportion of them are; but, apart from the fact that, as a gentleman qualified to speak on the subject—for he had spent three years in them—observed, “The life led in them tends to make a man an incurable loafer,” there are frequently difficulties in the way of placing a chronic drunkard in one. The expense is great, his business is apt to suffer even worse than it has done during the occasional bouts of intoxication, and the home may consequently be wholly broken up through his long absence. Before subjecting a patient to the idle life and undesirable companionship involved in a year’s confinement at a retreat, Dr. Tuckey suggests that it would always be desirable to try the effect of hypnotic treatment. There is much to be said in favour of this, of course, at the hands of a qualified medical man, seeing that, as Dr. Tuckey assures his readers, “it is easily applied, and, if surrounded with proper safeguards, is absolutely unattended with risk, either physical, intellectual, or moral.”

Dr. Tuckey’s book is well written, and free from extravagant enthusiasm; we strongly recommend all interested in the important social and medical questions of which it treats to give it a careful perusal.

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THE LONDON WATER COMPANIES claim extraordinary privileges as regards monopoly, doubtless with an eye to enhancing the amount of claims for compensation at some future time, when Londoners insist on having a better, a purer, and a cheaper supply. In advancing such preposterous claims the companies—at all events those deriving their supply from the Thames—have overlooked the fact that Parliament, having granted the powers under which they exist, can annul or modify such powers.

**PATENT, *alias* QUACK, MEDICINES.\***  
**No. 17.**

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THE NEED OF PROPER LEGISLATION AGAINST QUACKERY; THE "INDIAN OCULIST"; POISONS IN PATENT MEDICINES; "INSTANT RELIEF"; A CORONER'S WARNING AGAINST PATENT MEDICINES.

DURING the two years in which we have endeavoured in these columns to throw daylight into dark places, to expose the pretensions of quackery, and to show that the law regulating the sale of patent medicines stands in urgent need of drastic reform, we have at times found it necessary to wander away from the limits indicated in the title of these articles. Consequently, as has been pointed out to us by various correspondents, we might—as an Irish friend well put it, making an unconscious bull—enlarge the title by reducing it, letting it stand merely thus: Quack Medicines. But our readers have got accustomed to the title as it stands, and judging by the many encouraging communications which we receive, they look for it; so that as the series has reached such a length, that the reprints occupy two compact little volumes, we would fain let it remain the same; simply taking leave, now and then, to wander from the subject of patent medicines into the wider one of general quackery.

*"Populus vult decipi, et decipiatur"*—the Public is willing to be deceived, and let it be deceived—is an old Latin proverb, but this is too cynical and too callous a sentiment for the present age. The obvious duty of the State is to protect the weak and the thoughtless from scoundrels who would prey upon them at any opportunity.

Perhaps the worst class of scoundrel is the

quack, for he not only robs his victims of their money, but he damages their health as well; while, by deluding them with lying promises, he causes them to lose the precious time in which medical skill might have been of avail.

One of the most heartless cases of this kind has recently been brought under our notice. A respectable hard-working couple (the husband being a coal-porter), living in Bethnal Green, had the misfortune to have a child born blind. When it was a few months old, the mother took the child to the Ophthalmic Hospital, in Moorfields, where she was informed that nothing could be done to relieve the infant for the next six months. Of course, the most sensible, and, indeed, the proper thing for the mother to have done, after obtaining the best specialist opinion to be had, would have been to wait until the period had arrived for her to again consult the hospital surgeons; but this is not the first instance of maternal affection being stronger than common-sense. Most unluckily for the poor mother, and still more unluckily for her child, she had a bill handed to her in the street one day, headed:—"Numerous blind people cured. Dr. Jahangeir, the Indian oculist, uses Indian medicine. Medicine and examination for three days free. I will then tell you if I can do you any good or not." The abrupt change from the third person to the first person singular might tempt one to dwell for a moment upon the remarkable disregard for English grammar shown by the "Indian oculist," but the matter is too serious for us to give more than a passing notice to the wording of the bill, the intention of which was evidently to convey to the public that Jahangeir was a qualified "Dr.," and that he was a man of unprecedented skill in the treatment of all affections of the eye, as clever in these diseases, say—according to his own assertions—as the "Reverend Specialist," whom we adverted to at considerable length in recent articles, professes to be in the cure of deafness.\*

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\* The articles which have already appeared under this title in HYGIENE have been reprinted, and can now be obtained in two volumes, 1s. each (post free for 14 stamps), of Beaumont & Co., Limited, 39, Southampton Street, Strand, W.C. For contents, see advertisement in the present number of HYGIENE.

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\* See "Patent, *alias* Quack, Medicines," Vol. II.



The anxious mother fell into the trap, and carried her child to the address indicated in the circular, with the result that in the course of some weeks Jahangeir swindled her out of £3 7s. The child died of convulsions the day after the last occasion on which it had been taken to Jahangeir. Dr. F. J. Reilly, of Victoria Park Road, was called in to see the child, when he found it collapsed and dying. In his evidence, at the inquest subsequently held on the child, he stated that he examined the child's eyes carefully, and found that each eyeball was extensively affected with glaucoma. In his opinion, the Moorfields surgeons were quite right in not doing anything; further, he was of opinion that the interference of the so-called "Indian doctor" in all probability accelerated death, especially if the woman who assisted the Indian doctor used friction with drops of atropine, as he had been informed was the case. The following evidence of one of the witnesses examined before the Coroner (as reported in the *Eastern Argus*) will give some idea of the way in which the Jahangeir juggle was carried on, and of the extent to which the swindling was practised: "Maud Wright, a nurse girl, stated that she took the baby to the Indian oculist on the Wednesday—the day previous to the child's death—when 'a young woman put some stuff in the baby's eyes.' She got it out of a drawer, a 'little brown stuff,' rubbed it on a slate, melted it with her finger, and, taking a long piece of steel or tin, put some on both ends, and then put it in the baby's eyes. The child used to cry very much. There used to be a number of people waiting at the place." Poor little infant! Who can say how much it must have suffered during the many weeks that it was periodically tortured by the "young woman" and the Indian oculist? If rough, the woman's treatment was so far superior to the man's that it was fairly cleanly, whereas the man was, it is said, in the habit of inexpensively moistening any powders with his saliva prior to application. This woman, a Mrs. Young, appears though, in her way, to have been as

great an impostor as Jahangeir; for, although she gave herself out as having been a nurse in a German hospital, this was (as might be expected, judging from the rest of the business) a miserable fabrication; the plain fact being that she was a woman whom Jahangeir had picked up in the North, when he was on a tour in that part of the country. He appears to have visited numerous populous towns in England, Wales, and Scotland in his wanderings; and the report of the inquest published in the newspapers has brought many letters to Dr. Reilly, the majority containing heartrending details of cases of fraud and, worse still, loss of sight at the hands of this vagabond. At Glasgow, he was accompanied by a confederate, represented to be his brother; they cleared out barely in time to escape a police prosecution. Sometimes, for instance, when at 187, Harrow Road, W., these atrocious quacks called themselves "Dr. Jahangeir Mastakeem"; "Mistake 'em," the dupes might with reason have styled them. Great credit is due to Dr. Reilly for the way in which he has exposed Jahangeir; as well as to the Coroner, Mr. Wynne E. Baxter, for his outspoken comments on the fearful amount of injury done to the community by quackery.

Coroners have, as Dr. Danford Thomas has pointed out in his article on the "Sale of Poisons," published in the last number of *HYGIENE*, many cases brought before them where people have died through dosing themselves with patent medicines containing powerful poisons. In the *Surrey Comet*, of January 14th, there appeared under the heading, "Death from Narcotic Poisoning—a Warning against Patent Medicines," the account of an inquest held at Hampton Wick, by Gordon Hogg, Coroner for West Middlesex, on the body of a lady, fifty-five years of age, who had died on the previous Wednesday of narcotic poisoning under peculiar circumstances. It came out in evidence that for some months the deceased had been in the habit of drugging herself with various quack preparations which she had pur-

chased in consequence of the visit of a Sequah lecturer to Kingston. Beginning with the "Prairie Flower" mixture internally, and Sequah's Oil externally, she passed on finally to Sequah's "Instant Relief," which, according to the witnesses called, she took frequently. As we have already stated ("Patent, *alias* Quack, Medicines," Vol. I., page 63), "Prairie Flower" contains in a two-ounce bottle:—Water 735 grains, aloes 105 grains, carbonate of soda 35 grains, and a few drops of the tinctures of capsicum and myrrh. So Mr. A. W. Stokes, F.C.S., public analyst for Paddington and other large metropolitan parishes, reported; as for the much-vaunted oil, the same authority informs us that it consists of a mixture of two-thirds turpentine and one-third fish-oil, scented with a few drops of oil of camphor. Now, neither of these preparations, although absolutely devoid of most of the marvellous properties claimed for them, can be said to be specially harmful; but "Instant Relief," concerning which the Coroner gave such a solemn warning, contains morphia, which is the active principle of opium, the narcotic properties of which are too well known for us to dwell on them. Both opium and morphia are scheduled as dangerous poisons under the Sale of Poisons Act, which rightly imposes stringent regulations concerning their sale. But these same drugs are added, with more impunity than discretion, to scores of patent medicines which can be procured at any village store, grocer's, draper's, or oil-shop, the only qualification required for their sale being that the vendor should annually pay a few shillings for a licence to sell patent medicines. Can anything be imagined more absurd, or more dangerous to the public? A man might traverse the whole of London without being able to procure at a chemist's a poisonous quantity of opium, or any of its compounds; yet, if he chose, he could fill a room with bottles of this or that nostrum, containing, in the aggregate, poison enough to put a troop of soldiers *hors de combat*, by merely going into, say, some stores,

and putting down the necessary amount of coin.

We cannot bring this article to a close without recording the fact that we seem to have made at least one convert to the opinions we expressed in a former one, the convert being no less a personage than the chairman who presided recently at the general meeting of the shareholders of the company known as Sequah, Limited. In the course of his speech, the chairman remarked on the reforms requisite in the management of the company, and deprecated the methods which had hitherto been adopted for forcing the sale of its preparations—namely, "lectures from wagons, the use of brass bands, and the extraction of teeth." We fully agree with him in his denunciation of such censurable practices, and we are even prepared to go the whole length of endorsing his statement that "the remedies of his company were as good as any other patent medicines." But, having regard to the numerous analyses of other patent medicines which have been published in *HYGIENE* during the past two years, we can only arrive at the conclusion that the term "good" admits of so many gradations as to give special force, in the case of patent medicines, to the proverbial saying, "*Bad's the best.*"

THE EDITOR.

FRYER'S "DESTRUCTOR," now largely used in many of our chief towns for the purpose of getting rid of town refuse, was the invention of Mr. Alfred Fryer, who died at Wilmslow on December 13th. The deceased gentleman, who was the third son of Mr. Simson Fryer, surgeon, of Rastrick, near Huddersfield, possessed remarkable inventive genius, and was well known in scientific and literary circles. In 1865, when he was the senior partner in a large firm of sugar refiners at Manchester, he designed an apparatus termed the "concretor," for the treatment of raw sugar, whereby a great saving was effected in the carriage of that article to Europe. In 1870, he was one of the members of the Solar Eclipse Expedition to Sicily, and succeeded in photographing some of the most remarkable phenomena then witnessed. He was the author of valuable papers on "Vital Statistics," "The Cost of Living in Different Countries," "Balance of Trade," "The Silver Question," and other important subjects.



### OUTCAST SIBERIAN LEPERS.\*

IN the year 1890, Miss Marsden formed the determination to visit and personally inspect the condition of the numerous unfortunate lepers to be found in the province of Yakutsk, a part of Asiatic Siberia. How she performed this arduous and, indeed, dangerous task is well described in her recently-published book, about which there is the charm not only of romance—for is there not much romance in the fact of a woman's undertaking a difficult journey of many thousand miles into the interior of a country where no native of Western Europe has even set foot before?—but also of enthusiasm in a good cause. The book has to be read throughout to be properly appreciated; and it will well repay perusal, whether on account of the writer's adventures by land and by water, of her troubles and privations, of the graphic descriptions, or of the modest manner in which Miss Marsden narrates travels of which a strong, hearty man might be naturally proud, much more a delicately-nurtured, unaided woman.

Previous to starting on her journey, Miss Marsden succeeded in obtaining an interview with the Queen, and, subsequently, with the Princess of Wales, both of whom were much interested in her project; while the latter gave her an introduction to her sister, the Empress of Russia, who rendered considerable assistance and encouragement. Before going to Siberia, Miss Marsden visited Jerusalem and Constantinople to inspect the condition of the lepers at those places; at St. Petersburg she had audience of the Russian Empress. Then her real journey began, involving twelve months' travel and constant exposure to perils of many kinds. Those who imagine—and Miss Marsden has come across such mistaken individuals—that it was a kind of pleasure trip would soon become undeceived by

reading her book. Sledging many weary long miles in the most inclement weather, roughing it for weeks at a time on river cargo-boats, and travelling through dreary, interminable wastes and forests, she arrived at Yakutsk, the capital of the province of that name, 5,000 miles from St. Petersburg. Not a particularly cheerful place at the best of times, Yakutsk must be fearfully uninviting in the winter. It has the evil reputation of being the coldest place in the world. For about eight months in the year, the mean temperature is 92° Fahr. below freezing point, the ground is frozen to a depth of thirty feet, and the immense forests are scenes of utter desolation. Daylight lasts only from about 10 a.m. to 2 p.m. In such a country, where it is a struggle for even healthy people to keep alive, it can be imagined, though only imperfectly, how dreadful must be the sufferings of the poor lepers—"the most pitiable and the least cared for of all God's creatures," says Miss Marsden—driven out from the towns and villages, compelled to herd together in miserable huts in the forests, far away from all other human habitations, ill-clad, and subsisting on scanty, unwholesome food.

At Yakutsk Miss Marsden commenced her memorable ride of 2,000 miles, on horseback, to Vilnisk, near the Chinese frontier of Siberia, in which district the lepers are congregated. Here she found the unfortunate sufferers in such a deplorable condition as absolutely beggars verbal description. Indeed, but for the photographic sketches which were taken, and are reproduced in Miss Marsden's book, people reading her accounts would have, doubtless, formed the conclusion that her descriptions must be exaggerated.

The sights that Miss Marsden witnessed determined her to try every available means to alleviate the condition of the lepers, and she is now endeavouring to raise sufficient funds for founding a proper colony, or village, for the reception of the lepers, their medical treatment, and social improvement and supervision. It is

\* "On Sledge and Horseback to Outcast Siberian Lepers." By Kate Marsden. With numerous Illustrations from Photographs and Drawings. 243 pages.

a noble work which Miss Marsden has set herself, and it is one of intense difficulty ; but she has a powerful stimulus, the silent voice of conscientious duty, and she has a quiet, steady way of perseveringly working for the cause she has taken in hand. She seems to have expunged the word "Impossible" from her vocabulary ; and she toils on in a fashion that must, if her life be spared, lead to ultimate success. We heartily wish her "God-speed."

### THE MOVEMENT IN FAVOUR OF THE NATIONAL REGISTRATION OF PLUMBERS.

DR. TWEEDY, F.R.C.P., speaking at a meeting on the occasion of the recent visit of the Lord Mayor of London to Dublin, and referring to an illuminated address presented to the Lord Mayor (who is this year Master of the Plumbers' Company, London), by the plumbers of Dublin and the district, said it was a great pleasure to him to be allowed to add a few words of welcome to the address which had just been read. The District Council for Promoting the National Registration of Plumbers had, in his opinion, acted very wisely in making itself as representative as possible ; it had not confined itself to having among its members merely those who were engaged in practical sanitary engineering, but had called in also members of other corporations to assist in its councils. This arrangement seemed to him particularly felicitous in the case of the College of Physicians, which he had the honour to represent. That body had always had at heart the interests of technical education, and among the items now in the curriculum which had been introduced for perfecting education were the subjects of hygiene, public health, and preventive medicine, and in carrying out the practical details of that they were entirely dependent upon practical workers in sanitary engineering. The College of Physicians had also another bond of sympathy with this Association, and that was in the question of registration. Education was all very well in its way, but the test of an education being sound was by examination, and he rejoiced that this Association for the Registration of Plumbers was following up a sound and practical education by insisting upon the registration of all who chose to join the Association.

It was a great pleasure to see the Lord Mayor of Dublin having as his guest the Lord Mayor of London, for there was fresh in the minds of some of them the gracious and genial reception which Alderman Knill gave as Chairman of the Reception Committee of the great Sanitary Congress which assembled in London last year. He believed the visit of the Lord Mayor of London would be productive of great and far-reaching results.

LECTURES TO PLUMBERS. — The Plumbers' Company are including a series of lectures on "Hot Water Supply for Domestic Purposes" in their course of lectures to plumbers. The first lecture of the series was delivered at the Borough Road Polytechnic, on Monday last, by Mr. F. Dye. Forms of apparatus dating back some sixty years, as well as the most improved modern appliances, were illustrated and described. Special attention was called to the many erroneous impressions entertained by workmen and others. The students were requested to make a small model apparatus of glass tube, which could be done easily in the manner described ; and it was pointed out that the making of actual models was the most practical manner of acquiring the requisite knowledge. Particular stress was laid on the importance of conserving the heat within the pipes and apparatus in order that the water issuing from the taps might be of the highest temperature. In urging the importance of this, the lecturer said : "It is really barbarous to erect an apparatus purposely to furnish hot water at taps, yet permit the heat being radiated and dissipated from the pipes in corridors or casings where it fulfils no good purpose whatever. Heat so radiated is heat totally lost, and clearly represents so much lost fuel." The incrustation of domestic boilers consequent on the use of "hard" water was dealt with, and illustrated by diagrams and specimens. Dealing with the subject of burst boilers, the lecturer attributed accidents of this kind to four main causes—viz., (1) frost ; (2) shortness of water ; (3) the use of stop-cocks in main circulation ; and (4) incrustated deposit in the pipes.

PENRITH, unlike many other towns in England, is so fortunate as regards future water supply that Dr. Stevenson, of Guy's Hospital, who had been specially engaged to report upon the subject, sums up the question by stating that "the difficulty felt in determining what scheme to adopt was simply an embarrassment arising out of the riches about Penrith in the matter of water supply." Further, the cost of any of the various schemes that are before the authorities would be relatively low as compared with the quantity and quality of the supply which would be obtained.



## NOTES AND NEWS.

FOOTBALL ACCIDENTS have been more than usually frequent, in some instances fatal, lately; giving additional force to the advice sarcastically given in the following lines, published some time back in the columns of one of the insurance newspapers:—

“How to die rich?—(Don't tell your wife,  
Mayhap she loves her ‘hub’)—  
Just pile Assurance on your life,  
Then join a Football Club!”

\* \* \*

THE DIETETIC VALUE OF SALT.—The physiological effects of chloride of sodium (common salt) are of the highest importance. In maladies characterised by a diminution of the secretion of gastric juice, and at the commencement of convalescence, when the secretory and contractile powers of the stomach are at a low point, a certain quantity of salt is indispensable to proper assimilation. The addition of salt to milk prevents its coagulation in presence of the acid gastric juice, and we are thus in possession of a simple means of preventing the dyspeptic symptoms which often follow the use of cow's milk as an article of food.

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REASONING BY ANALOGY.—“I advise tapping,” said the doctor, after having exhausted all the powers of his healing art on the case. The father of a family, a hard drinker, was bloated with dropsy to the size of a barrel. He had drunk nothing but whisky for years, but the doctor said he was full of water, nevertheless, and advised him to be tapped. The old man consented; but one of the boys, more filial than the rest, blubbered badly, and protested loudly against it. “But why don't you want father to be tapped?” “'Cause nothing that's tapped in this house ever lasted more than three weeks.”

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BLOCK DWELLINGS FOR THE WORKING CLASSES.—The third volume of Mr. Charles Booth's work, “Life and Labour of the People in London,” has just been published. It contains a somewhat discouraging account of the model dwellings in the metropolis. In 1889 there existed 418 of these blocks; since then some sixty have been added. They contain in all about 36,000 tenements. The light, air, and sanitation is reported to be bad in the majority of these, specially bad in many. Nor is this to be wondered at. When the idea of block dwellings was first introduced, the avowed intention

of the promoters was to provide decent rooms at the lowest possible remunerative return to the shareholders. Now, the chief—we had almost said the only—object in view is to extract as high a rent as can be got out of the tenants, so that money can be found to pay big salaries to the principal officials, as well as keeping up the dividends. The consequence is that many of the model dwellings, erected on the block system, although avowedly established to benefit the working classes, have no more real philanthropy about them than could be claimed for a railway, a gas company, or any other commercial enterprise.

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HEAVY FINE FOR NUISANCE.—At a recent sitting of the City of London Sessions, held at Newington, sentence was passed on two men who had been prosecuted at the previous sessions by the Plumstead Board of Works, and convicted of a common nuisance caused by gathering fish offal from fishmongers' shops, and taking it through the streets in an open cart without disinfectants, thus creating an offensive nuisance. Sir P. H. Edlin, in passing sentence, expressed a hope that, although the present state of the law did not entitle the prosecutors to recover any costs, the Treasury would take the question under consideration, and hand over the fine to the Plumstead Board of Works. The fine imposed on one of the defendants, the employer of the other one, was £60, which was afterwards reduced to £40. In addition, both defendants were bound over with a surety to be of good behaviour for twelve months.

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COTTAGE HOMES FOR CHILDREN.—A deputation from the Sheffield Board of Guardians has had an interview with Sir Walter Foster, Parliamentary Secretary to the Local Government Board, and laid before him their proposals relating to a scheme for cottage homes for children chargeable to the Union. Sir Walter expressed great interest in the scheme submitted to him, which contemplates a new departure in the matter, and aims at a better classification of the adult paupers and children, and promised early attention on the part of the Board to the proposals of the Guardians.

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CHOLERA.—Cases continue to occur in Budapest, and two or more deaths are reported daily from this disorder. A most alarming outbreak of cholera has occurred at the Nietlieben Asylum, in Germany, a building almost isolated. Nearly 100 cases have occurred up to date, the mortality

having been in the proportion of one in three. This local epidemic is attributed to the use of impure water taken from a river in the neighbourhood of the asylum. It is a curious circumstance that, in 1886, when cholera spread all over Germany, it commenced in this identical institution. Fatal cases of cholera have also occurred, despite the cold weather, at Hamburg, and in Schleswig, and elsewhere. There is little room for doubt that, in the course of the spring, cholera will reappear in an epidemic form in various parts of the Continent, and continue throughout the summer months. Great vigilance will, therefore, have to be exercised to prevent its getting a firm foothold in this country.

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**GERMAN COAL AND BAD GAS — A POOR EXCUSE.**—The South Metropolitan Gas Company has been summoned before the magistrate at Southwark Police Court, charged with having, on numerous occasions last year, supplied to their customers gas of a lower standard of purity than that fixed by Act of Parliament. A witness (Mr. Livesey) called on behalf of the company testified to the difficulties which the defendant company had had to contend with, owing to the failure of the Durham coal supply through the strike of last year, and the impossibility of getting rid of the excess of sulphur contained in the German coal which the company were obliged to make use of. He further stated that no complaint of impure gas had been made against the company for twenty years. No police-court complaint, possibly; but surely the witness must have overlooked the period, only a very few years back, when the greater part of the large district supplied by the South Metropolitan Gas Company was in a state of semi-darkness after nightfall for many weeks. The deficiency and bad quality were then attributed to complications which arose between the company and its workpeople; a matter with which the public had nothing to do, and for which they ought not to have been made such serious sufferers. Seeing a gas company possesses a monopoly, the least that the South Metropolitan Gas Company might have done would have been to make some compensation for the injury inflicted on the health, comfort, and businesses of their helpless customers, by making a reduction of their charges; but, if such a proper step was adopted, the Press completely ignored the fact. On the recent occasion, the magistrate imposed a fine of £4 and costs on each summons, the total penalties amounting to £155 16s.

**CRINOLINE.**—In the course of the wordy warfare as to whether this hideous fashion is to be revived or not, we have come across only one argument in favour of the hoop that may be considered as having a hygienic bearing. "Many ladies wear such heavy skirts," say the advocates of crinoline, "that it is desirable to use crinoline for the purpose of enabling them to sustain the great weight constantly dragging upon the hips and lower part of the body." Really, now, would it not be better to discard such an injurious practice as excessively weighty skirts than to devise any method—cumbrous, clumsy, and ungraceful—for the simple purpose of making it a little more tolerable to those who voluntarily submit to it?

\* \* \*

**SCHOOL BUILDINGS.**—A circular has just been issued by the Education Department to all Her Majesty's inspectors of schools, requesting them to supply fuller and more detailed statements than are given in their annual reports respecting the condition as regards buildings and apparatus of all schools in England and Wales. This should lead to important information bearing upon their sanitary condition.

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**A MODEL LODGING HOUSE.**—The London County Council have just opened a large building for single men in Parker Street, Drury Lane, which will prove a great boon to the class for whom it is intended. Only those persons who have personally seen the interior of a low-class lodging-house can have any idea of the squalor, dirt, and general insanitary condition of the establishments which many poor working men have had to make their homes. The area occupied by the County Council's model lodging-house was condemned, some time back, by the sanitary authorities, and a number of wretched, unwholesome dwellings were consequently demolished. The cost of the building, furnishing, &c., may be put roughly at £20,000. It comprises accommodation for 375 men, each of whom will have a small, separate dormitory, 7 ft. by 4 ft. 6 in., with bed and bedding. The lodgers will also have the use of kitchens, cooking utensils, and laundry, and the sanitary arrangements have been specially looked after. The heating is by means of steam pipes, while the lighting is provided for by electricity. The charge per night is fixed at the modest sum of fivepence, it being calculated that a sufficient revenue will be received to pay 3 per cent. on the outlay incurred. Indeed, it is hoped that the fee may be later on reduced to fourpence.



HOW TO DETECT THE PRESENCE OF SEWER GAS IN A ROOM.—Saturate unglazed paper with a solution of acetate of lead in rain, or boiled water, in the proportion of one ounce of the lead salt to eight ounces of water. Allow the paper to partially dry, and then hang it up in the room which is suspected to contain the deleterious gas; if this is present in any considerable quantity, the paper is completely blackened.

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OPHTHALMIC AFFECTIONS IN SCHOOLS.—Dr. Cohn, of Breslau, examined more than 10,000 German scholars with reference to the alarming increase of shortsightedness amongst school-children. He reported that the children attending rural schools were almost free from the affection, but that it was more prevalent amongst them in proportion to the demands made upon the pupils culminating to the maximum in the higher schools; also, that the degree of shortsightedness, as well as the numerical proportion, increased from class to class, rising from the lower to the upper.

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GOOSEBERRY JELLY MADE ENTIRELY FROM SEA-WEED is one of the frauds in food which the Paris Municipal Laboratory has brought to light. It is coloured with fuchsine or some similar material, and the flavour is given by a compound of five parts of acetic ether, four parts of tartaric acid, one of succinic acid, one of aldehyde and ceanthnic acid.

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CAVIARE.—It is stated that the annual export from South Russia of this article of food, which is the preserved roe of the sturgeon, is upwards of a million pounds in weight. The greater part is shipped from Tanganrog, and it is mostly sent to Greece, Italy, and Central Europe. The demand for it is comparatively small in England and France.

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SHE KNEW SO MUCH BETTER WHAT WAS THE MATTER WITH HER.—*Dr. Smalldose*: "The appetite a little deranged, that's all. We shall put you right in a day or two."—*Mrs. Flyteighe*: "Oh! don't say that, doctor!"—*Dr. S.*: "Eh? What do you wish me to say?"—*Mrs. F.*: "Please say you don't think I can possibly get through the winter if I don't at once go off to Nice."

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ANCIENT AND MODERN CUSTOMS.—In the house-

hold book of the Northumberland family for 1515, we are informed that a thousand pounds was the sum annually expended in housekeeping; this maintained 166 persons, and wheat was then 5s. 8d. per quarter. The family rose at six in the morning; and my lord and my lady had set on their table for breakfast, at seven o'clock, a quart of beer, a quart of wine, two pieces of salt fish, half-a-dozen of red herrings, four white ones, and a dish of sprats. They dined at ten, and supped at four in the afternoon. The gates were all shut at nine, and no further ingress or egress was permitted. But now,

"The gentleman, who dines the latest,  
Is, in our streets, esteemed the greatest;  
But, surely, greater than them all,  
Is he who never dines at all."

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MAKING RAIN is not making progress at the rapid rate promised by American experimenters some time back. General Dyrenforth had quite a field-day lately in Texas; what is described as "a terrific bombardment of the heavens" having been kept up from morn till eve; the latter cannot, however, be spoken of as it often is, as "dewy eve," for, though an enthusiast at one point in the neighbourhood asserted that there had been a "slight sprinkle," the assertion lacked corroboration from the many spectators who, well armed with umbrellas, had come to witness the results of the General's efforts to prove his theory of rain-production by concussion. The General should try electricity. It would certainly cause less disturbance in a neighbourhood; but then, the General's object appears to be partly to "make a noise."

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THE ROWTON HOTEL, as Lord Rowton's model lodging-house at Vauxhall has been dubbed, has quite recently been opened. The idea of its construction is that a large class of respectable working men, single and without homes of their own, will gladly avail themselves of this substitute for the common places where they were compelled to seek nightly shelter, known as fourpenny or sixpenny "dosses." For the modest sum of sixpence per diem, each person using this establishment is entitled to a separate bedroom, the use of a kitchen, dining-room (with knife, fork, cup, plate, and saucer), lavatory with hot and cold water, smoking-room, and library. Each bedroom, 7 ft. 6 in. by 5 ft., is well-warmed and lighted, and furnished with an iron bedstead, mattress, and bedding complete. The building will accommodate 482 lodgers. It is expected to be self-supporting.

# Hygiene,

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## SPECIAL NOTICES.

EDITORIAL.—The Editor begs to express his thanks to numerous correspondents, and to state that he will be pleased to receive any communications and articles coming within the scope of *HYGIENE*, reports of medical officers of health, items of local or general sanitary interest, &c.

PUBLISHING.—*Subscriptions* for 1893 are now due. *HYGIENE* will be sent for twelve months, post-free, on payment of 6s. only, to any address in Great Britain, Ireland, United States, Canada, France, Germany, Austria, Belgium, Netherlands, Italy, Spain, Portugal, Switzerland, Prussia, Denmark, Norway, Sweden, and other countries included in the Postal Union.

## THE HOUSING OF THE POORER CLASSES.

By THEODORE THOMSON, M.A., M.B., Medical Inspector of the Local Government Board, formerly Medical Officer of Health for Sheffield and for Aberdeen.

To every Medical Officer of Health, and more especially to him who has charge of a large urban district, the better housing of the poorer classes is an ever-present problem, of which the partial solution is sufficiently difficult to occupy a large share of the attention he gives to his duties. Such is the magnitude of the task, so great are the various difficulties to be overcome, and, too often so small is the meed of success

with which his efforts are rewarded, that he may be excused if he occasionally allow a feeling of discouragement to overcome him.

It is not that we of the present day house our poor worse than did our predecessors of fifty years ago. On the contrary, comparison of the evidence around us with the evidence handed down to us from the past, shows clearly that in this respect we have improved. Yet one cannot but feel that progress is slow, and that an almost overwhelming task lies before the worker in this field. He who has to deal practically with the subject soon discovers that the poor, with the better housing of whom he is concerned, are so dissimilar, that he makes for himself a rough division of them into two classes, for which, in some respects, different treatment has to be adopted.

There is a class constituted by those whose incomes are small, and to whom the struggle for existence is hard, but who contrive to lead fairly decent and self-respecting lives; and there is the class which comprises the failures of life—the loafer, the criminal, the drunkard, and a few to whom fate has been unkind, and who have thus sunk to a level, for their presence in which, unlike the majority of their companions, they have not themselves largely to blame.

The houses of the former of these two classes are often fairly comfortable. No one who has much knowledge of the subject is unaware of



the fact that the poor, but decent, working man does not usually inhabit a loathsome hovel. But, although the house he occupies may be as I have described it, yet he is badly off in that he pays too much rent.

A middle-class person, in the receipt of £400 or £500 a year, would not relish having to contribute a sixth, a fourth, or an even larger proportion of his income for house rent, as the poorer working man has often to do. And, in large towns, his house, whatever its internal condition, is usually situated in a crowded neighbourhood, and gives little opportunity to the tenant of taking country walks, and breathing the fresh country air. Neither is the poor agricultural labourer to be unduly congratulated on his advantage in this respect over his City brother; for, as a rule, the structural defects of his habitation, which is often a mere tumble-down barn, counterbalance the benefits accruing from surrounding open space. The houses of the second of these two classes are of a much worse type of surroundings, in structure, and in internal condition. Closely huddled together, with filth of all descriptions accumulated in the vicinity, damp, dusty, and dirty are the houses of the lowest social stratum.

Both at home and abroad, the poor may be roughly classified in some such way as this, and those who deal with the amelioration of their dwellings, find that in the housing of the poorer classes are involved two distinct problems. I do not mean to say that many of the remedies which apply to the evil conditions affecting the one class do not also apply to those affecting the other; but I do hold that, while there are remedies common to both, there is a point at which, because of the very different characteristics of these two classes, divergence takes place in the course to be pursued.

During the past forty years there has been at home and abroad a great deal of legislation bearing both directly and indirectly on the housing of the poorer classes. Such legislation has been very different in different countries;

the rate of progression of such legislation, and the manner in which the laws have been put in force, have varied much, and, at the present day, the leading civilised countries are far from having the same legal provisions on this subject. It may well be, indeed, that the legislation which is suitable for one people is unsuitable for another; or that means other than legislative, adopted with success for the amelioration of the condition of the poorer classes in one country, are unfitted to succeed with those of another; but some methods, applicable to all, or to more than one, there are sure to be.

My own working experience has been in England and Scotland only; any knowledge that I possess of the problem as it presents itself elsewhere being that gained as a reader or an observer, not as a working official; and, therefore, I shall deal with the question in the aspect it has had for me as a Medical Officer of Health in this country.\*

In England and Scotland the health officer has many opportunities of aiding in the improvement of the poorer class of houses by seeing, so far as lies in his power, that the provisions embodied in the various Health Acts, and in the Housing of the Working Classes Act, 1890, are carried out. Many of these provisions are of great utility, and no medical officer who does his duty need feel that he has failed to help towards the betterment of his less fortunate fellow-men. But, if his heart be in his work, he will also feel that he would fain have done more than he has been able to do, and you will find that he is ready to criticise the means he has had at his disposal, to comment on the methods, of utilising such means, and to suggest improvements in both these directions.

For example, the existing law is not always enforced as it ought to be. This may be the fault of a sanitary authority which has more sympathy with the property owner than with the property occupier; or it may be the fault of

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\*This paper was read before the International Congress of Hygiene, held in London.—ED. *Hygiene*.

the official charged with the care of the public health, who may not sufficiently spur his authority to do its duty. To my mind, the remedy for both these defects is the same. The person best fitted to see that a sanitary authority does its duty is the Medical Officer of Health, and if there be a good health officer there is a good guarantee that this duty will be done. But at present there is no certainty that a good health officer will be provided, even in the majority of districts in this country; on the contrary, there is a certainty that many unsatisfactory officials will be appointed. For this I do not blame my professional brethren, but rather praise the large number who, for a nominal recompense, devote, to the detriment of their private practice, a totally disproportionate share of their time to public work. What is to be expected in the way of the amelioration of the condition of the poorer classes for £5 per annum? And yet there are districts in which that amount, or even less, and many others in which but little more, is paid to the official who nominally supervises the health of the people. Even in those districts where the Medical Officer of Health receives a more suitable salary, a difficulty is placed in the way of his stimulating the sanitary authority, by making him liable to be dismissed by them from office at their pleasure. Many health officers, notwithstanding this, faithfully point out to the sanitary authority their duty; but why, I ask, should such a difficulty be put in their way? In Scotland, under the recent Local Government Act, a step in advance has been taken by making the appointment of county medical officers compulsory, and by rendering their dismissal without the consent of the central authority impossible. It is difficult to see why this principle should not be applied with good effect to England, or to any other country.

When one reflects that the real pivot on which turns the carrying out of the Housing of the Working Classes Act, 1890, is the Medical Officer of Health; that to him, in that Act, constant

reference is made; that on him, when possible, is thrown responsibility; that, therefore, according to his capacity or incapacity, his time or want of time, will the Act be efficiently or inefficiently administered—it clearly becomes very desirable that for each sanitary district, or combination of districts, there should be such an official, suitably paid, and not liable to be dismissed at the pleasure of any local body, whose apparent interests he may have damaged. With a good staff of efficient and independent Medical Officers of Health, the Housing of the Working Classes Act, 1890, will be put in operation more effectively than any of its predecessors, or than it is itself otherwise likely to be. This want of health organisation I regard as one of the great obstacles to the abolition of the present insanitary dwellings of the poor, and their replacement by more suitable habitations.

But, given a suitable administrative staff throughout the whole country, the question that next arises is whether the laws under which they would work are sufficient for the purpose for which they are intended. To this question I think an answer is found in the fact that every year are formulated provisions, which sometimes fall to the ground, sometimes pass into law in private or in general Acts. An example of the difficulties which beset the path of the health officer is found in the 91st Section of the Public Health Act of 1875, where the word "Nuisance" is so defined as to frequently render it impossible for a magistrate to order the abatement of insanitary conditions. Most health officers probably have discovered that the street sewer may ventilate itself directly into a bedroom without creating a nuisance according to law. Any reader of a sanitary journal will constantly find in its columns similar complaints, accompanied by suggested improvements of the existing sanitary laws.

In connection with the Housing of the Working Classes Act, 1890, arises an important



economic question I have said that the poorer working man pays too much rent for his house. In that Act powers are given to sanitary authorities to deal with unhealthy areas—powers which, in some of the larger towns, are being utilised, and which will aid in providing more suitable and relatively cheaper dwellings for the poor. Whether it will suffice remains to be seen. He would be a bold man who would maintain that legislation of this class will stop where it now is. The difficulties met with in attempting to properly house the poor are enormous. As things are at present, the poor man has, in large towns, to live near his work, in order to save the cost of daily transit, to economise by dining at home, to be nearer the great provision marts, where he can procure cheap food, and to enable his wife and children to find in the neighbourhood of their home some occupation which will eke out his scanty income. Hence results accumulation of poorer labourers near their work, with consequent great demand for shelter, and a fictitious value of house property.

It is an example of the much-admired law of supply and demand, in which the demander, being heavily handicapped, suffers severely. Is he to have better wages? is his house rent to be lowered? or are facilities to be given him to live farther from his work? And if so, how are all or any of these things to be done? All these are matters which lie at the root of the question; and the Medical Officer of Health, while he knows that such things are officially beyond his province, yet feels that this health question is really an economic question, and that the true solution is an economic one.

In the same way the dilapidated building, occupied by the poorer class of agricultural labourers, is likely to persist, so long as the labourer is in receipt of a wage that does not enable him to pay a rent sufficient to return any interest on the capital necessary to erect a decent cottage. Should his sanitary authority build him a cottage and let it to him at a loss?

Or should he have a higher wage, and how is he to get it? Or should he have a land allotment with his cottage to enable him to pay a remunerative rent? These are not questions for a Medical Officer of Health to settle, but the settling of these will do much to settle the sanitary question with which he is concerned.

Something else will have to be done with the lowest class of all. Of these it may be said that, were they to-morrow housed in a palace, they would in ten days make it a pig-stye. For them remedies are required other than those needful for the class immediately above them. No doubt they will, despite themselves, to some extent, be benefited by sanitary improvements of their dwellings, by demolition of unhealthy areas, by improved lodging-houses under the existing laws. But so long as there is an insanitary building left they will go to it, for they do not admire sanitation. They will avoid all model dwellings, for they do not wish to be cleanly and orderly as there prescribed by rule, and they will destroy and fill with filth any interior that becomes theirs.

It is to be hoped that in process of time the benefits of education will effect some improvement in the members of this class, but it must be a long time before these benefits create any appreciable effect. Private effort, such as the noble work of Miss Octavia Hill and others, is one of the means to which one may look with hope. Possibly registration of all the worst class of houses, somewhat on the Glasgow model, with frequent and stringent supervision of the habits of the inmates, might be useful. Such supervision would not be pleasant to the inmates; but it is, perhaps, desirable that life should not be made too pleasant for this class of society, most of whom deserve no sympathy other than that which one bestows upon the victims of heredity.

There are some points of my subject into which I have not gone at any length, and others to which I have not even alluded; what I have set myself to do is, rather, to convey the leading

impressions suggested to me by my experience as a Medical Officer of Health. Briefly summarised, these impressions are, that although the present sanitary laws are open to improvement, yet that the most crying present need is not so much change of, or addition to, those, as a thoroughly efficient and complete system of health administration by capable and independent medical officers throughout the country; and that the final and complete solution of the problem of how to house the poorer classes is inextricably bound up with a great social difficulty, of which the settling will come to pass, either prior to, or coincidently with, the settling of that which has been the subject of this paper.

### THE CAUSATION OF CHOLERA.

By C. EGERTON FITZGERALD, M.D.

THE discussion on the cause or causes of cholera, and the great divergence of opinion existing thereon, remind one forcibly of the celebrated discussion as to the colour of the chameleon, in which, as now, each observer saw and spoke from his individual experience. The question is, May they not all be right? Cholera, like influenza, will eventually be found to be a miasmatic disease, of which the hitherto undiscovered germ can be conveyed through the air, by water, excreta, infected bodies, or clothing. What the special germ may be, we as yet know not; but that it multiplies with enormous rapidity under favourable conditions of heat, moisture, and dirt, there can be no doubt. Theoretically, one would expect it to be some hardy microscopic spore, ever present in certain localities, and ready, under exceptional circumstances favourable to its growth and development, to be produced in enormous volumes, whether in impure air, polluted water, in sodden soil, or infected bodies. We should thus expect it to follow occasionally the course of rivers, sometimes to descend in deadly clouds

in one place, while it rose over others, as it was borne by varying air currents with apparent caprice. Each individual as he is attacked becomes a fresh nidus, a hotbed for disease germs, which seek and require only a suitable soil or cultivating medium for their propagation; but a suitable condition of the atmosphere exists only under certain exceptional circumstances. This accounts for the rapid spread of cholera amongst large masses, especially dirty masses of men. Each unit of infection acts on suitable media exactly as would a particle of yeast, if introduced into a mass of fermentable fluid under the requisite conditions of temperature, &c. This is the explanation of the fact that, although cholera may arise sporadically anywhere under favourable but exceptional circumstances, it is endemic only in India, where, presumably, those requisite conditions constantly prevail.

That cholera does spread principally along the lines of human intercourse, that it may be conveyed by man, by water, by fomites, may be readily conceded without affecting the contention as to its miasmatic and aerial character and method of propagation.

That cholera is caused by Koch's vibrio is to the last degree improbable, and certainly unproven, although it may be admitted that the cholera bacillus is usually present in the dejecta; but, setting aside the many morphologically similar varieties of this bacillus already described as being ever present in the intestines, what does this prove? Simply that in cholera, as in so many other diseases ascribed to microbes, we have the media, the special soil, suitable to its growth and multiplication; just as we often find in some newly upturned earth the conditions favourable to the growth of the spores of the mushroom, or the seeds of the numerous weeds which so rapidly spring up and flourish.

The universal germ theory, now so eagerly and enthusiastically accepted, is not more generally believed in than was the humoral



theory or the dyscrasia of a former generation ; yet who credits these now ? And is it not possible that our successors may have to climb down from our present position in as rapid and undignified a manner as we have already done from the beliefs of the past ? How, otherwise than by aerial and miasmatic infection, can we explain the abrupt termination of an outbreak of cholera on the supervention of frost, heavy rain, or a high wind ? How account for the sudden simultaneous visitation, or the as sudden cessation, of cholera in two villages separated by many miles of intervening valley (as recorded by Surgeon-Colonel Hamilton), its sudden appearance in ships at sea, in places where the water-supply is beyond reproach, and where its importation by human agency is to the last degree improbable ?

The miasmatic theory perfectly fits in with and explains Pettenkofer's "subsoil water" hypothesis, for it is just when the surface water has sunk below its ordinary level that the very conditions of moisture, heat, and evaporation most suitable for the growth and propagation of miasmatic spores are present. Nor does this supposition clash with the fact that cholera is communicable by drinking-water when contaminated with cholera germs. Supposing that water to be of the right temperature, and to contain fermentable matter, it will prove an excellent cultivating medium for the development of cholera germs ; but should the temperature of the water fall below a certain point, it will soon become innocuous.

To my mind, all evidence tends to show that cholera is caused by some miasmatic germ which can be disseminated in a variety of ways, that the contagion is generally air-borne, and that the comma bacillus has no etiological connection with it, but flourishes only in the excreta, because it there finds a congenial soil.

## AN AGE OF STIMULANTS.

By J. MURRAY-GIBBES, M.B., C.M.,  
Mooroopna, Victoria, Australia.

THE age we live in is most emphatically an age of unrest, for none of us are satisfied with the condition we find ourselves in, but have an intense craving for something, the majority of us know not what. It is an age of discontentment. Now there are two kinds of discontent—a healthy and an unhealthy discontent ; a healthy discontent longs after, and works for an improvement, whilst an unhealthy discontent is an inactive grumbling.

What has caused this great change in our national character ? for notwithstanding the fact that John Bull was always a grumbler, yet at the present time he has excelled himself in this respect. Not only has he become saturated with this spirit of unrest, but his wife and daughters have taken the complaint to a most alarming degree. John Bull used to be a grand, slow-thinking animal, but now his animalism is inferior to his intellectualism. As there must always be a cause for every effect, it may not be uninteresting to enquire into this great change.

The characteristics of an animal can in a great measure be gauged by studying its food habits, for we find that birds alter their plumage when fed on a diet differing from what they are accustomed to, or are fed on food suitable to the work required of them, as do also dogs.

John Bull, till the end of the 16th century, lived on a very limited, though plain and solid diet ; and his method of eating would now be considered coarse, for Royalty, even in James I.'s reign, did not use forks, but the knife and their fingers in conveying their food to the mouth. After this date a number of new vegetables were introduced ; not that they came into common use, for John Bull is a very conservative animal, as we find that, although potatoes were introduced into England in 1585, they were spoken of in 1718 as of "little note."

With these new foods came improved methods of preparing the food for the table, it being taken in a more concentrated form. John Bull, though he has always liked a good solid food, has always been fond of his nut brown ale—not the ale we get in the colonies, made from glucose, but made from malt, and he even took kindly to the addition of hops to it. Wine he never looked upon as a necessary adjunct to his food, and the only kinds he really took to were port and sherry, for he looked with contempt on the thin acid clarets, &c. Ale and wine contain two constituents—a vegetable acid and alcohol; and so does also cider, another beverage largely drunk in the West of England.

In the 17th century a new class of beverages were introduced into John Bull's food customs, and a class that any one who had studied his peculiarities would never have expected that he would have taken kindly to, and I think it must have been owing to Mrs. John Bull's good influence over her worthy spouse. The new beverages were tea, coffee, and cocoa, which were first sold in London by Mr. Galloway in his coffee house in the year 1657, and they very quickly became popular. About the same time he took very kindly to a new custom which, although it could hardly be classed with food or beverages, yet as they are so intimately connected with, I am perfectly justified in classifying it with them. In fact, he took to tobacco smoking and snuff taking, to the intense disgust of his good wife.

Here we find that most conservative of beings—John Bull—to all appearances, changing his food customs and adopting new ones, and indulging in a habit his wife highly disapproves of.

There are many actions we do for which there are two reasons, viz., a conscious and an unconscious reason, and the latter is the one I wish to bring out in this paper. The conscious reason why John took to these new practices was because he liked them; the unconscious reasons

we shall discover when we have analysed his new articles of diet.

There is hardly a nation or race living on the earth who do not indulge in some beverages, otherwise than water, with their food. A large number take beverages containing alcohol, but the remainder take beverages which do not; but they all take some which contain either an animal or a vegetable acid; therefore this acid must play a very active part in connection with food customs. Malt liquors, wine, cider, and all other fermented liquors are necessary acid mixtures. Tea, coffee, and cocoa also contain an acid, viz., tannic acid, and in this respect alcoholic and non-alcoholic beverages are similar.

Sir William Roberts tells us that, as the result of his experiments, he finds:—

1. That the vegetable acids in alcoholic and non-alcoholic beverages delay or prolong the digestion of our food.
2. That this delay is required to prevent a too sudden influx of rich nourishment into our blood, as it would upset the tranquil operations of the various organs of the body.

Man eats, as a rule, three meals a day, each meal consisting of concentrated food—food deprived of most of its useless, or indigestible parts. Animals eat the useless with the useful, and this prolongs their digestion. A carnivorous animal gorges himself with food, and this concentrated nourishment passing suddenly into his blood, he is in a semi-apoplectic, or sleepy state, for some hours after such a meal. (Some men do the same.)

The acids in beverages prolong digestion by deadening the ferments, whose duties are to change the various kinds of food from an insoluble into a soluble state; an excessive use of them deadens them to such an extent that they cannot properly perform their work, and hence we suffer from indigestion or undigested food.

Having seen that these beverages all contain



a vegetable acid which acts on the digestive powers, we will enquire into their other properties.

Malt liquors, wine, and beer all contain an active principle which acts on man's nervous system, viz., alcohol.

Tea, coffee, and cocoa all contain an active principle, which acts on the nervous system, viz, therein.

Both alcohol and therein act first as a stimulant and then as a seductive. Alcohol acts principally on the animal nervous system, whilst therein acts principally upon the higher nervous system. Alcohol gives a man increased fighting power for the moment, but its seductive action soon comes on, whilst therein braces up his nervous system, leaving his intellectual powers free. Both taken in excess continuously produce a high state of excitement of the nervous system commonly known as the horrors. Alcohol develops the animal powers of man, whilst therein develops the intellectual powers, the great strides civilization has made during the present century being chiefly due to it.

The increased consumption of meat eaten at the present time accounts for the increased consumption of both these beverages. The intellectual advancement of mankind requires him to take more brain food, consequently we find the meat bill increasing yearly; owing to the increased consumption of meat an increased consumption of food delayers is required. Australasia is a great meat-eating country, and she consumes twice as much tea as the old country. The almost universal prevalence of dyspepsia at the present time is owing to the beverages taken with our meals containing so much vegetable acids. Mrs. John Bull and her daughters are the largest consumers of tea, except perhaps their Colonial cousins, and we cannot but notice the alteration it is making in their character and physique. They are becoming strong advocates for women's rights, are entering the professions, and in every way striving to take the place of man as bread winners, forgetting

that in this strife for supremacy the end must be, *i.e.*, if they succeed, they will become like the female bees, the workers, or neutrals, and the males will become the drones, for woman's brain power must develop at the expense of her animal powers. This development, if indeed it is a development, amongst women shows itself in their diminished power of suckling their young and in the prevailing decay of the teeth, so that in 100 years we may expect man to be a toothless animal, for teeth, like other organs, will waste from non-use, and owing to the preparation of our food at present, they are not so essential as formerly. Tea drinking amongst the young, diminishes the power of their food ferments, consequently they will not be so robust, if indeed they are now. Therein is a powerful stimulant, and when taken by the young, inculcates a craving for alcohol when they grow up. Fruits, Nature's food delayers, contain vegetable acids without any stimulant, and consequently are suitable for both the young and the adult.

The age we live in is an age of stimulants, for we all crave for them, either in the alcoholic or non-alcoholic form, owing to our present food customs, and this is the reason why the drink bill goes on increasing in magnitude, notwithstanding the great extension of teetotalism.

Tobacco contains the dual properties of these beverages, and is smoked owing to them. After a meal a smoker feels uncomfortable because the digestion of his food is rapidly taking place; but a few whiffs of it slow down the process, and he feels comfortable.

Malt liquors, wine, cider, tea, coffee, cocoa, or chocolate and tobacco all belong to the same class, viz., digestion delayers, and the consumption of them is a food custom. They all have elements of harm in them if taken in excess. They all are good if taken in moderation, as John Bull has proved by the lead he has always taken amongst the nations of the earth.

**PATENT *alias* QUACK MEDICINES.\*****No. 18.****ELECTRIC BELTS—THE WEAK SPOT IN THE HARNESS.**

In *Hygiene* for August, 1892, we described the case of an unfortunate agricultural labourer, so poor that he could barely get a sufficiency of food of the humblest kind, who was persuaded by his credulous neighbours—deluded by lying advertisements in the newspapers—to lay out his little all in the purchase of a much-vaunted and still more extensively-advertised electric belt. This poor fellow was actually dying at the time from cardiac dropsy. It is almost needless to say that he derived no benefit from his purchase, and he shortly afterwards died. One of our contributors received permission from the deceased man's relatives to examine this *precious* apparatus. And what did it turn out to be? Why, half-a-dozen discs of tin, each as big as a florin, carefully stitched up inside a flannel belt, though not worth so many farthings.

Yet, as we pointed out, these fraudulent so-called electric appliances are advertised in the leading papers—journals which would refuse admission to most of the quack remedies in vogue; and we gave some particulars of an advertisement of this class, commencing with a “magneto-galvanic sleep promoter at two-and-a-half guineas,” and concluding with “the electro-spiral hood to keep life in patients dying from exhaustion, until the treatment has time to take effect. Price £500.”

We went on to say: “Which is most to be wondered at—the mendacity of the advertisers, the folly of the purchasers, or the weakness of the publisher of a high-class paper in allowing

its columns to be made the medium of such palpable imposture? And this sort of thing goes on day by day, week by week, and month by month, in hundreds of papers bearing a high character for respectability and veracity, until one blushes for journalism.”

We were somewhat taken to task for using this and additional strong language in the particular article in question, now forming a portion of Volume II. of the reprints, entitled, “Patent *alias* Quack Medicines.” But we felt we were in the right, and we stood our ground, certain that others would see the matter in the same light as we did. We were then alone, or nearly so, in our denunciations of electric quackery.

But since then some other journals have taken up the matter, foremost among which we may mention our excellent contemporary, the *Electrical Review*. Its strictures upon a testimonial given by a West-end physician, in favour of the Harness electric belts, led to an action for libel brought against the proprietors of the *Electrical Review*—not by Harness, but by the physician referred to.

Now this was rather singular, to start with, and, needless to say, was much commented on by the counsel for defence. It is only fair, however, to state in this connection that the plaintiff's counsel did their best to show that, as the defendant's paper had specially named the plaintiff, and had stated that his report on Harness's belts was “a grave reflection on the intelligence of the medical profession,” adding some other pungent observations, he was the person primarily attacked, and was consequently bound to take action in the matter. The action was, in one respect, like an old-fashioned action for seduction, brought by the next friend of the party most injured. But, while Harness's name did not appear as a plaintiff, it was an “open secret” that he found the money for the action; as was only reasonable, perhaps, seeing that Harness had paid the West-End physician a paltry £100 for the magnificent

\*The articles which have already appeared under this title in *Hygiene* have been reprinted, and can now be obtained in two volumes, 1s. each (post free for 14 stamps), of Beaumont and Co., Limited, 39, Southampton Street, Strand, W.C. For contents, see advertisement in the present number of *Hygiene*.



testimonial which enabled Harness to draw untold thousands into the Oxford Street till. The hearing of the cause took place on February 16th and the following day.

The *Pall Mall Gazette*, of February 17th, said: There were parts of Court No. 9 in the Queen's Bench Division, which looked, yesterday, like the corners of a ship's deck during a storm. Not by reason of any nautical costume worn by anybody in court. Nor was there any appearance of sea-sickness on the part of the junior bar. But there were belts lying about in some profusion, looking not unlike life-belts until they were regarded more carefully.

They proved to be the electropathic belts associated with the name of Harness. Their character had been maligned, and they had come into a court to prove by their champion, Dr. Tibbits, "that they did cause electric currents to pass through the bodies of their wearers." The storm, though not an actuality, raged figuratively throughout two days.

The evidence given by the defendant's witnesses, including in their number, Lord Kelvin, President of the Royal Society of London, and other eminent experts, carried everything before it, and after the judge's summing-up, the jury, retiring only ten minutes, returned a verdict for the defendants. Lord Kelvin, when giving his evidence, took one of the belts (for which, by the way, a witness had stated that he had given five guineas) in his hands, and said that it was not capable of generating any electricity, if worn on the body in the condition in which it then appeared.

There was nothing in it which could realise the expressions used in the pamphlet about increasing the intensity of the electrical current. In cross-examination, Lord Kelvin admitted that if the belt were worn on a perspiring body, and the coppers and zincs were connected, then a current would flow. But, even this slight admission was deprived of any possible value to the plaintiff's case by the

qualifying remarks that the connecting wire was not long enough, and that it would break when the belt was worn. "You are not a medical man, I think?" observed the cross-examining counsel, adding with satirical flattery, "that being the only attainment you do not possess?" "I am an M.D.," Lord Kelvin quietly replied, "I am an hon. M.D. of the University of Heidelberg." "But you have no qualification to practise?" "I have a license to practise, but I have never exercised it." "You express no medical opinion on the belt?" "None, except that it would lead a person wearing it to imagine that he or she was feeling a current. The irritation of the knobs upon the flesh would give a comforting idea of that sort to the patient."

On the question whether there was anything in the printed instructions to tell the wearer how to get the current, Lord Kelvin said there was nothing. "That is your criticism, is it?" asked counsel. "It is not my criticism. It is merely a statement of fact. The connections placed in my hand could have been intended for no other purpose than to connect the two zinc sets together, and the two copper sets together. That could not possibly create a current, of course."

It is unnecessary to go through the entire details of the case, or to quote the evidence of other witnesses for the defence. We must, however, quote the following extract from the Judge's (Mr. Justice Mathew's) summing-up: "A sharp, pungent, and unpleasant criticism did not constitute a libel so long as it was honestly written."

In the course of the two years during which we have fearlessly and, as we have good grounds for believing, with public benefit, exposed the pretensions of numerous quack nostrums, it has several times fallen to our lot to be threatened with an action for libel. We must observe that either further reflection on the part of the threatener, or the manner in which such threats have been treated, has

had a discouraging effect; but, in future, we shall have an additional weapon of defence in Mr. Justice Mathew's definition, as quoted above.

From "magnetism" to "magic" is but turning over a page in the dictionary, and we shall, therefore, deal in our next issue—appropriately that for April 1st—with a remedy to which this startling epithet has been applied by the—don't all supply the missing word at once, please!—vendor.

THE EDITOR.

## REFUSE BURNING.

By W. GEORGE LAWS, M.I.C.E.

Any paper on refuse burning must of necessity partly include the subject of refuse removal, as before we can discuss the advantages of burning the refuse of a city we must know of what it consists, where and how it is collected, and what part of it, if any, is so injurious to health that it must be quickly removed from the neighbourhood of human dwellings.

A short walk before breakfast in almost any part of London, or any provincial town, will furnish us with the needful data.

We see the scavenger leisurely sweeping into the channel the "slop" or "dust" (as it happens to have been a wet or dry night) for which, it might almost be said, that no theory but that of "spontaneous generation" has ever fully accounted. It is diversified by paper in every possible form (except the clean sheet) but especially from the advertising hoardings, and dotted here and there with countless indescribable odds and ends. Many of the latter puzzle us until we notice on the sidewalk, carefully set out before each door, a series of boxes, pails, buckets, and anything that will hold, or will not hold, the various clearances of a retail shop—paper again, as card boxes, wrappings, and cuttings, with ashes, straw, sawdust, bottles, tins, and scraps of food.

If the district is residential there is more of the animal and vegetable refuse and less of the sawdust and straw, but still the paper and tin. If we happen to be near a market, the slop, etc., is rich and thick with relics of the particular goods dealt in.

We notice that a rough selection is being made among the rubbish already. All that comes under the scavenger's broom is shovelled into one form of cart, while the "box ashes," as they are technically called, are tipped into another, and still others are filled from baskets carried by the dustman from the interior of the houses in the residential districts. If these latter are followed to their dumping place, there is still the same variety and still the same staples—paper, ashes, coal, bread, waste food stuffs, and wasted food, bottles, and the all-prevailing tin. And whether the walk be taken to London or the provinces, in England or on the Continent, Europe or India, there will be very much the same component parts, and but little difference to their proportions.

The first thing that strikes one is that amidst all this medley, there is much that is useful, much that is harmless, and a good deal that is neither, but that these three classes are very badly mixed, and here we begin to touch the fringe of the refuse burning problem.

That part of the material which contains enough manurial matter to be worth laying on the land is easily got rid of, and will pay its own carriage by rail far enough to clear the town of it, if sent as crude manure. If handled or treated in any way, either chemically or mechanically, its value is increased, but its cost raised as much or more. But the less of the other classes of stuff it contains, the better the value as manure, and the wider the area over which there will be a demand for it. The best treatment we can give it is the negative one of not mixing it. Again a great deal of the scavenger's part of the refuse is harmless, and may be used to fill up excavations or to raise land, without any fear of future decomposition;



and here also we must not mix it with either of the other two classes, or it ceases to be harmless. We have, therefore, three broad classes of material to deal with, and practically in about equal proportions :—

- 1st. Crude manure, one third.
- 2nd. Sound material, one third.
- 3rd. Unsound stuff, one third.

This last class is the troublesome part of the refuse to deal with. It cannot be used, cannot be left alone, and spoils whatever it is mixed with : we must get rid of it, and at any cost. Well, we can send it off by rail and dump it in a convenient spot within the borders of some other sanitary authority. We do so, and all goes smoothly for a while, until one of two things happens. This friendly neighbouring authority changes its sanitary inspector, and he, in the first flush of official zeal, takes the gloss off his virgin broom by attacking our rubbish dump, and having right on his side, and well aware that he will not tread on the corns of his own masters, he covers himself with glory, and sends us further afield in search of fresh fields and pastures new. Or even worse : some fine day the heap gives unmistakable signs of being on fire, and rouses the country for miles around with hideous stinks, and the only remedy is to cover it with a thick coat of sand and retire, lucky if not indicted.

If our town is situated on a tidal river the troublesome material can be sent to sea, but here again difficulties beset us. For about 50 days in the year the barges will not be able to get over the bar. In the winter season there may be a full week at a time when it is unsafe to venture out. We must provide barge room enough for a week's supply to be kept on hand, and to be kept where it is pretty sure to become a nuisance, real or imaginary, it matters little which. When we have got fairly out to sea we may find that one half of it floats, and though with the best intentions, we have cast our refuse on the waters, after many days it may return to us and strew the beach at some neighbour-

ing watering place, and again we are in trouble.

On the whole this is a dirty way of keeping the town sweet, and should only be adopted in cases of emergency, and until better means can be devised.

After all, then, we are driven to look for some means by which the obnoxious third can be dealt with within our own boundaries, and destruction by fire seems the only course available. It is at best but a clumsy mode of attaining our end ; it is not at all a cheap plan ; and worse, it is at present an unpopular one. But it is fairly effective and always available. Theoretically, the stuff should be sorted and utilized, the useful parts sold, and the refuse made into manure. Unfortunately this cannot be done by town authorities at even a reasonable cost, and the manure-making part gives rise to unholy stench. Private enterprise may succeed in paying expenses, and even in getting a small profit, but this has not yet been proved. Certainly public bodies cannot—first, because they would be at once indicted for doing what private manufacturers may do with impunity ; secondly, because there is no finality with public bodies, and they are constantly trying new and costly experiments, and making expensive alterations to their plant, which swallow up any possible economy. It is a pity that popular prejudice should have turned so strongly against refuse burning, as it certainly has the merit of very quickly resolving decomposable, and therefore dangerous matter, into its first elements, and with a minimum of nuisance in the process. Even a large destructor furnace in full operation does less to pollute the air than the smoke from an ordinary dwelling-house. But popular prejudice is always unreasoning and generally unreasonable, and the more formidable, on that account, as it is beyond the reach of argument or proof. The destructor furnace is pretty well known, being merely a wide, but shallow arch generally, with the fire grate laid on a slope to facilitate charging.

This is done from the upper end, the stuff being tipped down a sort of hopper mouth, and pushed and raked in a uniform layer of about twelve or fifteen inches thick, over the glowing embers of the last charge. This description really covers the essential principle of refuse burning—a fire grate of considerable area with a fire of moderate thickness and a good draught. Very few real improvements have been made on the original pattern, and in most cases complication has only served to increase cost without improving the result. Various plans have been tried for applying a forced draught, and though they have given good results, yet, when brought down to the final test of the cost per ton burnt, their supposed advantage vanishes.

A fault which has more than any other led to partial failure and public complaint, has been insufficient chimney power. Shafts have been built with too small an area for the work to be done, and hence too rapid a current. The material burnt is one which naturally produces much dust, and a quick draught carries this dust with it out of the chimney, to fall somewhere in the neighbourhood, and causes a nuisance and legitimate complaint. On the other hand, a shaft of twice the area would do the same work with a current of half the speed, and most of the dust never reaches the outer air, but can be caught in very simple dust-traps. The writer's experience decidedly leads him to prefer an ample natural draught (which may even require to be stopped down by dampers) to any of the forms of forced draught, which is an expensive way of getting work done by machinery that is too small for the purpose, and only justifiable where space is unavoidably limited.

The state of the material burnt leads to another form of nuisance. It contains from 25 to 40 per cent. of water, and sometimes, when sludge is burnt, even more. This moisture must be driven off in the form of steam, and, however hot the fire, a certain time is occupied in the partial distillation, and fumes

and empyreumatic vapours are carried over with the steam, which, however innocent, are very distinctly traceable by smell. That they are harmless makes little matter; they are slightly pungent and aromatic, but distinct enough; and the honest British ratepayer has a nose of wonderful power when applied to the detection of official sins.

To meet this difficulty the fume-cremator has been devised, by which the vapour from the destructor cells, in passing to the chimney, is drawn over a bed of incandescent coke, and in so passing is raised to a heat of  $1,200^{\circ}$  to  $1,500^{\circ}$ , practically completing the partial distillation commenced in the cells, and resolving the empyreumatic vapours into their primitive gases, odourless at last. The fume cremator has effectually met a real want, and gone far to render possible the introduction of the refuse destructor into situations where prejudice would otherwise have been too strong for it.

It may be useful to give the practical results of a trial of refuse-burning extending over five years, in which care has been taken to set down accurately every item of expense, and so to arrive at a reliable result, in no way biassed by trade considerations.

The authorities of Newcastle-on-Tyne, in 1885, determined to make a trial of refuse-burning, and having secured a suitable site on their own property, put down the plant for a destructor of twelve cells. Wishing to feel their way, they erected at first six only of these cells, which were completed in June, 1886, and have been steadily burning night and day ever since. The capital cost of erection was £5,060, which included a chimney-shaft large enough for twelve cells, and also roads, tram-lines, and other works necessary for the larger establishment, so that the increase to twelve cells now just completed has cost in all £7,000. The results now given are of the working of the six cells only, and they have been debited with the full capital at first expended, viz., £5,060. The interest on this has been taken at 4 per cent.,



being  $\frac{1}{2}$  per cent. more than the Corporation of Newcastle pays on its stock. No charge for redemption has been taken into account, it being considered that where the plant was fully kept up by repairs and renewals, a fairer estimate of the actual cost would be arrived at by taking interest only on capital, and charging repairs and renewals as they occurred.

The site on which the works stand had been let by the Corporation for market gardens at £5 per acre, and when handed over to the Sanitary Committee, the rent was raised to £10 per acre, or £25 for the  $2\frac{1}{2}$  acres occupied.

Rates and taxes are charged as paid, the site being within the boundaries of another authority. A careful and regular account has been kept of all the material brought to the destructor. A charge of 1s. per ton is made to all private persons, tradesmen, and others, who send refuse for burning, and also when diseased meat or food stuffs condemned as unfit for use are dealt with.

Clinker and ashes are sold to contractors and others at what prices they will fetch, and when used by the Corporation themselves are charged at the same prices as paid by the public. These various receipts are treated as credit items, and deducted from the total cost of burning. We have burnt 61,120 tons of material at a nett cost, including all expenses, of £3,097, making the cost of burning just over 1s. per ton, or, more exactly, 12-16d.

This cost may be divided thus :—

|                                        | Per Cent. | Per Ton. |
|----------------------------------------|-----------|----------|
|                                        | d.        | d.       |
| Interest, rent, rates, and taxes ..... | 37·6      | 4·56     |
| Repairs and renewals ..                | 8·8       | 1·10     |
| Labour .....                           | 53·6      | 6·50     |
|                                        | —         | —        |
|                                        | 100·0     | 12·16    |
|                                        | —         | —        |

With respect to this last item of labour is a somewhat noteworthy fact to record. For the

first three years and a half the work was done by two shifts of 12 hours each. At the end of 1889 there was considerable agitation in the labour market, and the gas stokers got a very material reduction of hours and increase of pay. The destructor men claimed a similar change, and the shifts were reduced to eight hours each, that is, three shifts are now employed working eight hours, and resting sixteen hours. The wages, by agreement with the men, remained the same per shift, so that the cost of labour was raised just 50 per cent. Naturally it was expected that the cost of burning would rise proportionally, that is, about 25 per cent., as labour formed about 50 per cent. of the work.

On working out the results, however, at the end of 1890-1, and up to date, the cost of burning which, up to the end of 1889, was 12·3d. per ton, has actually fallen to 11·9d., or nearly  $\frac{1}{2}$ d. per ton, while labour alone for the first three-and-a-half years was 6·9d., and for the last eighteen months 7·7d. per ton. This is an interesting and significant fact, and though, perhaps, it is really more suited for discussion in another section of this Congress, yet the writer cannot but call attention to it as throwing a light on the labour question which must be specially interesting to engineers. Here is a case where, with identically the same plant and machinery, a lessening of the hours of work by one-third, viz., from twelve to eight, while increasing the total wage paid by 50 per cent., actually so far increased the output as to slightly reduce the cost per ton. It would be interesting to have the experiences of other employers of labour in this direction. To return to the experience gained at Newcastle, it appears that, with three shifts of eight hours each, the burning capacity of each destructor cell is slightly over 2,500 tons per annum, or eight tons per day of twenty-four hours. When it was attempted to increase this output it was found that the stuff was not so well burnt, and that the residue was more bulky.

As nearly as can be estimated the total residue is from 25 to 30 per cent. of the material burnt. It consists of a hard clinker, which has been found very useful for many purposes, and of sound dry ashes, which readily sell at 6d. per ton up to the full demand for them; but so far the output far exceeds the demand, and the unused part is tipped into an old quarry, where it is gradually forming useful land that will one day come into the market as building land.

The clinker has been much used for making the concrete bed in which the sanitary pipe sewers of Newcastle have been laid for the last nine years. It may be mentioned in passing that an ordinary sanitary pipe, when thus laid in concrete for half its depth, is just doubled in strength. A pipe, twelve inches in diameter, which, laid in clay, bore 30 cwt. laid on it before breaking, when laid in concrete, required three tons to break it.

The great difficulty in the way of refuse burning is the securing of suitable sites for the furnaces. It is not easy to overcome the prejudices of the people, and each ratepayer is anxious that the work should be done at his neighbour's door, and not at his own.

Probably every householder runs more real risk from the keeping of his own share of the refuse in his back yard than from the burning of the refuse of a whole district within 50 yards of him; but the people have a great deal to learn as to their own interests and their duty to the community, and till a great stride has been made in that direction a needful reform will be cramped and hindered, and where not actually prevented, will be saddled with difficulties and expense that ratepayers of the future will regret.

It is important that refuse destructors should be central for the district which they serve, so as to reduce the cost of cartage, which generally far exceeds the cost of burning, and for the same reason they should be placed on low rather than on high ground, so that the loads

may be down hill. Taking Newcastle, again, as an example, carting the refuse up or down hill make from 1s. to 1s. 6d. per ton difference in cost, more than the total cost of burning.

There should also be a ready means of getting rid of the 30 per cent. of residue, which does not so far find a market. If this is to cart again, the cost becomes heavy.

The real value of a destructor is, that however clumsy and costly the plan of burning our refuse may be, it is at any rate effectual as a means of getting rid rapidly and completely of readily decomposable and, therefore, dangerous matter.

With proper destructor power and efficient daily collection of refuse it should always be possible to get rid of dangerous material within twenty-four hours, before it has time to ferment and develop its peculiar powers. In no other way can this be done with so much certainty or so quickly. There is also this further advantage that by so dealing with about one-third of the refuse we render another third saleable, and the remainder harmless. And the cost of this advantage is 1s. per ton on one-third of the refuse; 4d. per ton on the whole. Surely not an extravagant price!

## ON THE CLAIMS OF SANITARY SCIENCE UPON THE CLERGY.\*

By the Rev. C. G. K. GILLESPIE, A.K.C.,  
Hon. Chaplain, Derby Infectious Diseases  
Hospital.

(Concluded from page 42).

THIS digression was introduced by a reference to defective drainage conditions, which, in themselves, come under another head; but the question of dilapidated houses can conveniently come in here. The last tenant sickened the owner, who says now, "There is the house, take it or leave it; only make up your mind at once, for there are plenty after it." The tenant

\*A paper read before the Derby Clerical Society.



finds the trap gone from the slopstone, which saves trouble, and passes without remark ; the outside sink is blocked up, and the slops run back into the house, or form a pool before the door. Perhaps they have energy enough to check this by taking up the trap and throwing it into a corner, or even cleaning it and putting back wrongly, so that the sewer gas, in either case, escapes before the door. There has been a settlement, and an ill-fitting door, first left open to save trouble, has been swung to pieces convenient for the fire ; hence nothing can be kept neat or clean in that cupboard. The sodden pavement has sunk just over the joint of the old drain, which has given way. The back window has no sashline, and so is kept shut. What is the poor tenant to do ? What is the poor owner to do, who has only a few of these houses to live by ? Here comes in the counsel of the trusted friend. Make the best possible of things as they are. Take up that trap again, see which way it fits, wash it out, put it into its place, and pour a pail of water down. Scour that cupboard, and tack on a paper curtain for the present, if you have nothing better. Show the landlord a clean house when he comes next, and let me see it clean when I come. Then I will have a word with him, and see if I can get him to do something, on the understanding that you can take care of things when they are put straight. I am glad to recall several instances in which this process met with entire success, to the great moral and physical advantage of the tenants and the at least equal relief of the owner. To him I now turn. It has been fashionable to regard him as a blood-sucker, callous to all considerations but that of collecting his rents. This is not always fair, though sometimes just, in the case of owners who are neither rich nor poor.

I was once invited by the Property Owners' Association of a great town to lecture on sanitary matters to its members. They all own slum property, and they all had feared that certain public proposals of mine were hostile

to them. At the close many of them distinctly and frankly pledged themselves to put into early effect certain defined sanitary improvements, asking me to urge the tenants to maintain their efficiency. The Chairman of the Association, whose previously vigorous opposition gave place to cordial support, made a practice after this of consulting me whenever sanitary repairs were needed on his property, most of which became as wholesome as the local conditions allowed. This is, perhaps, a convenient point at which to turn to the public sanitary work a clergyman may do. When the minute knowledge of every corner in which danger lurks, and a clear and accurate scientific knowledge of each form of danger, aided by sufficient acquaintance with technical construction to indicate the fit remedy, he is prepared to speak with influence at the right time, which will not be long in coming when his case is complete. If anyone think this exaggerated, I can refer him to the unanimous town's meeting, the formation of the local sanitary association, the prominence of the public health reform in the pledges of all the municipal candidates, the immediate action of the new Town Council, involving outlay of many thousands of pounds, the doubling of the sanitary staff, and the steady lowering of the death-rate, long one of the largest in the country. The whole of this was brought about without one harsh word, and with the hearty co-operation of all sections of the community.

In matters of medicine, we shall certainly do best by bearing in mind the well-worn maxim, *Ne sutor ultra crepidam*. Till the doctor comes, we should know what to do in emergency, so as to prepare for his skilled ministrations. We may then often help him by enforcing his directions, while our message of faith calms the mind of the patient. In this connection, the case is not forgotten of the unhappy clerical homœopathist whose girl patient died of an overdose of aconite.

I turn, almost in conclusion, to perhaps the saddest of sanitary facts. One child in every

five born in this country dies before the age of one year. The foul feeding bottle accounts for many. Many more are slain by the sins of their parents before their conception. Many are doomed to blindness almost from their birth, because of the crass ignorance of the women who, without elementary knowledge, take charge of mother and child at the time when trained skill is most needed. A very large number of poor children are born of consumptive parents, or, which is almost as bad, of parents too young for that responsibility. I will not pursue the several branches of this section, with which most of us are sadly familiar. But it is my duty to note that the overcrowding, the filth, the untidiness of the careless home, have more to do with moral and spiritual decay, inseparable from physical degradation, than is by many suspected. Not without reason and justice have many said, in effect, "See how we are condemned to live in what we call our homes, and judge if we are likely to understand or care for religious teachers who appear content to let us live with less comfort than dogs, but expect us to think like human beings."

In the ordinary course of our sick-room visitations, many useful hints can be offered, generally with good effect. One, important for all visitors, is, where possible, to avoid the traditional setting of the chair between the bed and the fire, that is, in the one continuous stream of exhalations from the sick body. Another, often disregarded, is the immediate disinfection, before removal, of all sick-room refuse. Still more frequently overlooked is the wet sheet used for isolating the room. The warmth of the room causes this to become dry and useless; which can be prevented by adding a little potash, or even salt, to the disinfectant. Chloride of lime, itself a deliquescent salt, seldom fails in this way; but its efficiency as a disinfectant is not always certain. It is well not to touch infectious patients unnecessarily. The hands can easily be washed.

But an affectionate friend of mine kissed a sick child whom he had privately baptized, forgetting that he was a bearded man. He kissed good-night to his own little son some hours after, and in the morning found him also in scarlet fever, from which he recovered with difficulty. All domestic animals should be rigorously excluded: a cat has conveyed diphtheria. Wool-sorters die of anthrax, from the hair of cattle; dogs, and even birds, may become vehicles of disease. The food utensils and vessels of the patient should be kept in the room, and cleansed there. Milk, especially, should be taken into the room only for the patient's present use, and on no account shared by any other person.

Under the Public Health Act of 1875, and more stringently under the Infectious Diseases Prevention Act of 1890, a notice to disinfect is left at the house by the sanitary officer. The paper has sometimes been shown to me as evidence that the people, having neither acted upon it nor even read it, were entitled to consider themselves free from further responsibility—in fact, as thereby certified to be "all right." I have been shown sealed bottles of disinfectants as proof equally satisfactory.

On the value of sanitary knowledge in school management, for proper fulfilment of Code requirements and for the diagnosis and checking of infectious disease, it would be almost impertinent for me to dwell, before such hearers, most of whom are active and diligent managers of large elementary schools, the structure and arrangements of which should ensure the maintenance of the best health conditions. In this connection one more example may be permitted. Looking up a scholar reported as sick, I found that the club doctor had told the mother on the previous day that scarlatina was probable. By the time of my call there could be no doubt, and I at once gave disinfectants, with instructions for their use. Some hitch in the arrangement with the club prevented the doctor from calling



again, and only after four daily visits could I get the parents to secure proper medical care, though they consented to full disinfection, and loyally carried it out as directed. The case was then reported to the sanitary authorities by the doctor called in, and the child taken to the hospital. The other three young children entirely escaped, though desquamation had begun before her removal. On mentioning this case to a young vicar, as illustrating our opportunities in this direction, he replied, with some scorn: "That is not work for a clergyman." Such a remark from such a source seems to justify the publication of this paper, and to need no other reply.

These details may appear trifling, and perhaps, to some, unsuitable for our joint consideration, when met to take counsel in matters of spiritual work and duty; but they are just things likely to be overlooked, perhaps, by all except ourselves, at the time of their vital importance; and, to take the lowest ground, our spiritual mission to the souls of men will not be less commended to them by their perception that we are men of practical sense, glad to use it on their behalf in things which they can judge.

Nothing is farther from my design, or any legitimate deductions from this paper, than to suggest the superseding of authority. "Do nothing without the Bishop" in Church affairs, nothing without the doctor in sick treatment, nothing without the local authority in public sanitary reforms, or in agitating for them. The medical men work, often with noble self-denial, by our side among the poor; and the sanitary officials are no less ready to work with us where they can, and to welcome our aid in all loyalty where, by the nature of the case, our influence goes farther than even their legal powers—and our opportunities for habitual observation, if we know how to observe, considerably exceed theirs in number.

To us who hold in trust the oracles of God by definite commission, and are pledged to their diligent study, it is not of small importance to

learn, by scientific proof, that in these later days the divine sanitary laws of the Pentateuch have been, in their general applications, tested as independent propositions, and found to be the best protection of national health; that the diseases of men and of houses there noted still exist and do harm; that modern research has found the dangers to human life in animals there noted as unclean. Nor is it unhelpful to remember that to the restoration of bodily health He devoted an immeasurable amount of beneficent power, who bore our infirmities and carried our sicknesses. And, in that He touched the kneeling leper, whom, like others, He could have healed with a word; that so small a detail as giving food to the child of Jairus, just called back to life, was not beneath His notice; that Simon's wife's mother, restored from a great fever, was at once enabled to minister to others—there appear to be strong encouragements for acting on the belief that, in our most sacred work, the care for the bodily welfare of our people claims a part as real and definite as that we have already learned to devote to the strengthening of their spiritual life.

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## THE HOMES OF THE POOR.

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WHAT a beautiful and touching picture poets and novelists sometimes draw of the peasant's home—a picturesque cottage, with pretty, well-cared-for garden, a smiling wife and merry children; in winter the armchairs of the grandfather and grandmother drawn up to the cosy hearth, and at all seasons a place for everything and everything in its place. But the reality we who have seen it know too well—a couple of dark, dirty, dingy rooms, a family bearing the impress of overwork, vice, and poverty; confusion and noise in the ascendant; in short, the peasant's cottage is often the dwelling place of everything unlovely, repulsive, and degrading. Yet, bad

as is the peasant's house, it is not half so revolting as the den of the far dirtier, stupider, and more vicious town labourer of the lowest type. Exceptions there are, and I have seen many, but go where you will in our large towns and country villages, for one clean, attractive cottage, several miserable hovels are to be found. The orthodox method of treating improved home accommodation is to enumerate all the requirements of a small household, to state the number of cubic feet of air each member of it will hourly consume, to point out what sanitary science, morality, and common sense demand, and then, when these things are not forthcoming, clamour for Government supervision, and denounce the landlords.

Moreover, in most quarters, one or two objectionable remedies are proposed, such as those huge, comfortless, expensive barracks, called model lodging houses; but neither quack remedies, nor Government inspectors, nor systematic health lectures will suffice in the face of the real obstacles to progress and improvement. What are these difficulties? First, we have the constantly increasing aggregation of thousands of families on a limited and altogether insufficient space, a crowding generally unnecessary, but not to be prevented by Act of Parliament.

Nothing is commoner than for two families to occupy a tiny cottage; they *must*, we are reminded, be near their work; they cannot live a mile off, and a move is not always practicable. Nevertheless, the men ride or walk morning or evening to their more or less distant place of employment, and still herd in their close court or fever-infested street. I have repeatedly seen instances of this, more particularly in the north-west districts of London, where men sometimes spend more on omnibus fares than would get a handsome cottage, with a good garden, near their work; and several instances, even more flagrant, came under my notice in Birmingham. Secondly, we have the

curse of early marriages and overgrown families. You find apprentices married to young girls, and young couples with nine children, who, in good times, earn a pound a week; but *what* in bad? What can sanitary science do in such a case—an apprentice married to a young girl, wages seven shillings a week? A case of the kind I actually saw in Birmingham 14 years ago. Thirdly, what can you do to cope with the vice, drunkenness, extravagance and improvidence running riot in our midst? I, as a medical man, not, however, one who has been a parish doctor—town parish doctors, as a class, have opportunities of seeing misery ten times more dreadful than come in the way of their more fortunate brethren—have actually seen both in London and in many other towns, large and small, cases by the dozen, and hundred, where everything that could degrade and impoverish seemed combined to effect the utter and hopeless ruin of all concerned. Ask any clergyman or parish doctor, any policeman or collector of rents, and study the fearful picture they can draw. Many a man and woman goes through life knowing and caring *nothing* for the horrors surrounding the homes of thousands of working-class families—living it is not, it is a struggle with disease and death, exciting disgust rather than pity; help and advice are unavailing; alms thrown away; without hope in this life, without hope in the world to come, existence drags on in squalor, profligacy and crime. And, in the last place, what happens when strikes, lockouts, illness, old age, idleness, or loss of work are playing their horrible part? Do you know, *you* who talk so glibly about national wealth, and the increase of population and prosperity, what lurks behind? Do you know that in every large town a hundred times a week the heads of families are taken ill, or meet with accidents; that in 90 cases in 100 the man or woman takes to bed for a week or a month, or six months, as it may be. In a week the family credit is exhausted, and then,



whether the weekly wages have been ten shillings or five pounds, whether work has been regular or not, matters little; misery and want reign supreme, and till the family income is restored, it is hardly possible to guess how body and soul are kept together. Bad times again—perhaps the man's own fault, or due to dislocation of trade, for which no one is directly responsible, but the cause matters little—what *they* mean to-day in a hundred thousand houses those only know who have probed beneath the surface.

In England a great part of the whole life of every man and woman must be passed in a house or a workshop. Our climate is mild, more particularly in winter—for the latitude *very mild*—but our summer is often chilly and wet, and our winters are always, even on the south coast, foggy, stormy, and gloomy. Out-door life is practically impossible, and hence, only in the extreme south of the larger island, in a few sheltered and sunlit valleys, is any attempt made at out-door life, even during the summer, and during the rest of the year, not even there, and during the whole year, in most counties, the family lives indoors. Few people take a meal a week in the open air between the first of May and the 30th September. In towns, thousands never take a single meal, and hardly ever sit out in the open air, the whole year through. Our climate is in large measure responsible for this. Hot dry weather is rare, and our mild winter is nearly always damp and gloomy. A good home is, therefore, most important to an Englishman; and perhaps drawing-rooms more gorgeous, libraries more superbly fitted up, and dining-rooms more perfectly comfortable, the earth does not show than those in scores of thousands of noble mansions and roomy villas; the imagination can desire nothing finer, nothing more charming; but from the well-carpeted rectory or pleasant suburban villa to the garret of the penniless or extravagant artisan, or the hovel of the twelve or fifteen shillings a week agricultural labourer—what a vast interval! Mere waste of time to

give hints about house accommodation. I, nevertheless, believe that with greater prudence, temperance, and discretion, the house accommodation of the poor could, in four cases in five, be improved in the course of a few years, and this without interference on the part of the Government. But I do not expect radical change as long as working-men are, as a class, what they are, as long as a Birmingham landlord, not a bad sort of man either, could say to me, “Working men don't mind where they live—anything will do for them.” To the working-man I would say, remember that even when you are at work your wife and family are at home; get the best house your means will admit; stint yourself in other matters, do with less meat, leave off beer, and throw your pipe out of window, and with the three, four, or, it may be, six shillings a week thus saved, you will be able to get a clean, roomy, comfortable house, with perhaps a little garden. If you cannot find a good house in one street, go into another; do not be afraid of a little walk morning and evening; exercise will do you good. Take care your house is in good condition—well drained, ventilated and lighted; sufficiently private to shelter its inmates from prying eyes; see that it possesses those comforts which should always be associated with *home*. How different would be the working-man's hard lot were he to value home more, and to pass more time in it; were it so clean, neat, and cheerful that he and his should find in it all they need, and were they to spend in it their happiest moments. As things are, this cannot be; and while English officers, wherever they may wander, look back to the beloved home of their childhood with touching affection and long to return to it, while the great families of the land cling to the ancient seats of their ancestors, the poor labourer and the toilworn mechanic seldom have a home, seldom try to make the place where they sleep and take their meals anything but a lodging, where they and theirs pass a few weeks or years; but whether

they live long in it or not, its gloom, dirt, and squalor never change. Far be it from me to say that working men never have cheerful and comfortable homes, or that some mechanics do not tenderly love their wives and families and peaceful cottages. But what ought to be the rule is the exception, and labourers do not seem to feel these things as persons more happily circumstanced would. The miseries, temptations, and dirt surrounding many families, are such that they would drive me and others like me to desperation and recklessness.

M. R. C. P.

### THE INCREASE OF CANCER.

This is an important matter, which, for some time past, has attracted the attention of medical men and sanitarians generally. The most recent contribution to the literature of the subject is a paper which was communicated to the Manchester Medical Society on January 25th last, by Mr. W. Roger Williams, F.R.C.S., of Preston.

In this paper, entitled "Observations on the Increase of Cancer," Mr. Roger Williams has brought together a large amount of statistical information; demonstrating that the proportionate mortality from the dire disease known as cancer is now four times more than it was fifty years ago.

In 1838, the first year after the Registration Act came into operation,—prior to which date there is no reliable source of knowledge as to the relative prevalence of different diseases—2,448 deaths from cancer were registered, giving the population of 160 per million living; but in 1890 the deaths due to cancer were 19,433, showing a mortality of 676 per million living.

Further, Mr. Williams calculates, having regard to the present extent of the mortality and the average duration of the disease, that there cannot be less than 60,000 persons now

suffering from cancer in England and Wales alone. Looking at the steady increase which has occurred during the last half century, "it seems certain," says Mr. Williams, "that if unchecked, cancer will ere long become one of the commonest diseases in modern communities."

For it is not only in England and Wales that this alarming ratio of increase has been observed. In Scotland the annual cancer death rate per million inhabitants, during the five quinquennial periods from 1861 to 1885, rose gradually as follows:—1861 to 1865, 404 per million; 1866 to 1870, 428; 1871 to 1875, 468; 1876 to 1880, 504; and in the final of these five periods, 1881 to 1885, the mortality amounted to 540 per million living. Continuing the enquiry, it is found that the Scotch death rate from cancer in 1886 to 1889 still continued to rise, progressively, from 590 per million living in the former, to 670 per million in the latter year.

Similar increases have been noted in other civilized countries where statistical records have been kept; in evidence of which fact, Mr. Williams gives an array of figures concerning the death-rate from cancer in Norway, the Netherlands, Prussia, Brussels, and New York, as well as in the colonies of Australia and New Zealand.

In Ireland, with its decrease of population and wide-spread poverty, somewhat singularly the death rate from cancer has been dropping for some number of years past; a circumstance which Mr. Williams quotes in support of his theory that the augmented cancer mortality has coincided with progressive population, increased national wealth, and marked improvement in the general well-being. This is a startling proposition to put forward; but elsewhere in his pamphlet Mr. Williams tones it down by stating that, in his opinion, want of proper exercise, and changed surroundings are the chief causative agents of the increased mortality from cancerous diseases. In other words, the general population, though better fed, live



in a less natural condition of life. There is greater crowding into circumscribed areas, less pure air, and a diminution of out-door life and exercise. In connection with this point, Mr. Williams remarks that the increased cancer death-rate in Great Britain has affected males to a greater extent than females; thus, in the forty years from 1851 to 1890, the increase of cancer mortality amongst males was 167 per cent., while the ratio of increase amongst females in the same period was only 91 per cent. The consequence is, the relative frequency of deaths from cancer in the two sexes, which was 1 male to 2·2 female, is now only 1 to 1·6. "It seems to me probable," Mr. Williams writes, "that the undue incidence of the increasing cancer mortality on males may be ascribed to the fact that of late, as the results of urbanisation, the conditions of life for men have come to resemble more closely those for women than heretofore."

But there are no more fertile causes of consumption than those which may be summarised in the term "urbanisation," as employed in its most comprehensive sense by Mr. Williams; yet, as he emphatically points out, there has been during the past twenty years a remarkable decline in the death-rate from phthisis and other tubercular diseases—a decline coinciding with the great increase in the cancer mortality. From the Registrar-General's fifty-second annual report we learn that the annual mortality per million living, from cancer, phthisis, and other tubercular diseases, was as follows in the two respective periods named:

|                           | 1861-65. | 1886-89. |
|---------------------------|----------|----------|
| Cancer .....              | 376      | 610      |
| Phthisis .....            | 2526     | 1598     |
| Other tubercular diseases | 784      | 674      |

During the intervening years between these two periods the death-rate from cancer has gone on steadily increasing, whereas that from phthisis and other tubercular diseases has decreased.

"I regard this decline in the prevalence of tubercular disease as the outcome of improved

hygienic conditions, due to that augmented prosperity which I have endeavoured to show, by its actions in another direction, is also responsible for the increased cancer mortality." Thus writes Mr. Williams. Now, to our mind, this seems like "a conclusion which is not conclusive," as Dr. Johnson remarked on a certain occasion; and we should be glad to have a clearer reason for what Mr. Williams has made very evident by his carefully compiled pamphlet, namely, the enormous relative augmentation of the cancer death-rate in Great Britain and many other civilised countries.

### HOW MUCH OUGHT WE TO DRINK?

AN interesting inquiry would be to ascertain which town in the United Kingdom is the thirstiest, that is, which gets through the largest quantity of alcoholic beverages per head. The palm must apparently be given to Leeds. Can its dingy and far from prepossessing surroundings have anything to do with its habits? Perhaps the squalid air of many of its inhabitants may be explained by the parching and unquenchable thirst which consumes them. A public-house map of Leeds was recently published, from which it appeared that there were 355 fully-licensed houses, 422 beer-houses, and 362 off-licensed shops in the borough—1,139 places selling intoxicating beverages. The population is 350,000, and Leeds is estimated to spend at least £1,213,000 per annum on alcohol.

One of the most curious facts in natural history is that the camel can work seven days without drinking, while man can drink seven days without working!

A question constantly put to the doctor is: "How much ought we to drink?" and estimates ranging from a quart to a couple of gallons a day are sometimes framed. A more pertinent inquiry would surely be: "Ought we to drink at all?" A protest is occasionally

heard that healthy people drink a great deal too much, and throw an immense amount of work on important and delicate organs; but some of the very people who protest against four or five meals a day, and who denounce alcoholic stimulants as poisons, are not infrequently innocently proud of the prodigious quantities of fluids which they get through, and the mistaken advice is often heard to supply unstintingly cold tea, milk and water, and other non-alcoholic drinks. Yet it is no new discovery that in hot weather and in severe work the less to drink the better, a superabundance of fluid actually encouraging, not checking, perspiration, softening the muscles, and intensifying thirst.

In the treatment of inebriety, about the worst possible thing, next to giving stimulants, is to supply fluids in excess, and the surest way to keep up the fierce craving for alcohol is to try to quench the thirst with unstinted quantities of beverages. We are getting wiser, and no longer regard the male portion of the human race as the "victims of unquenchable thirst," as George Eliot so wittily put it. Some years ago an ardent vegetarian lecturer disgusted a thoughtful audience in Birmingham with what they regarded as an audacious falsehood on his part—that he had once taken *no fluids* for a month, and had never felt better in all his life. "Yes," one of his listeners thought, "eaten an apple with a quart of syrup, and then said he had lived without fluids." And hard things were uttered about the poor fellow. But, to-day, we have met with a gentleman, evidently well-informed and to be depended upon, who assures us that two ladies, intimate friends of his, never drink fluids at all, but live mainly on porridge, nuts, and uncooked fruit, and enjoy vigorous health, are never ill, and never feel thirsty, so that there is no denying that life could be sustained in comfort and vigour without anything being drunk out of cups or tumblers, though, of course, even the driest food contains some water.

S. U. M.

## ADULTERATION.—THE SALE OF FOOD AND DRUGS ACT.

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WE have frequently pointed out in these columns that, however well-intended and excellently-framed an Act of Parliament may be, its public efficiency may be almost neutralised either by its permissive clauses, the apathy of persons whose duty it is to put it into force, or the manner in which it is construed by judicial functionaries. We know of no measure to which this remark applies more forcibly than to the Sale of Food and Drugs Act, 1875-1879. Scarcely a week occurs without what may be mildly termed a miscarriage of justice being reported from some locality or another, in connection with this Act. Our contemporary, *Food and Drink*, has devoted much attention to this subject, and we never take up a public analyst's report without finding therein some reference to the difficulties which are thrown in the way by magistrates who seem to throw their whole weight in favour of any defendant summoned under this Act. They not only ignore the object for which the Act was passed, but they raise all kinds of subtle sub-interpretations of definitions, clear enough in themselves.

We will make some references to the Act, so that those of our readers who have not the original before them can see for themselves its salient points.

Under the 3rd and 4th sections, it is enacted that no persons shall mix, colour, or stain, or knowingly permit any person under their control to similarly mix or colour any article of food with any ingredient which would make such article injurious or detrimental to the health of the consumer—the same enactment being made as regards drugs—under a penalty not exceeding £50 for the first offence, any subsequent offence to be punishable by imprisonment, with hard labour, for a term not exceeding six months. The maximum amount of the fine for a first offence, and the maximum



term of imprisonment to which an offender renders himself by a repetition, indicate sufficiently the intention of the framers of the Act, viz., not only to punish adulteration, but to deter people from dishonest practices. But, in practice, the Act, sound as it is in theory, too often becomes almost a dead-letter and a mockery. More often than not, the offender, if his advocate should not succeed in getting the case dismissed upon some legal quibble, is let off by the magistrate with a caution, or fined a paltry half-crown. It is an insult to common-sense to pretend, even, that such a trifling fine can be regarded as a punishment for an offence which may have been going for many months before a summons is taken out, or that it can produce any deterrent influence. On the Continent, the punishment for adulteration is administered with a severity suited to the gravity of the misdeed; in addition to which the magistrate is empowered to order a record of the judgment to be publicly posted in a conspicuous place, and further notified by advertisements in the papers, at the expense of the offender.

It is also enacted that no person shall sell, to the prejudice of the purchaser, any article of food or drug which is not of the nature, substance, and quality of the article asked for, under a fine not exceeding £20. But this protection to the purchaser is often rendered practically *nil*, in consequence of the latitude afforded by magistrates to dishonest tradesmen, under cover of sections 8 and 9, by which the vendor is exempted from the legal consequences of selling food and drugs containing foreign ingredients not injurious to health, if, when delivering such article, he supplies a printed label on the package or bottle stating that it is mixed. These two sections, as interpreted by a magistrate whose views of the relation between vendor and purchaser may be summed up in his favourite quotation, "*Caveat emptor*," are sufficient to deprive a prosecution of any chance of a conviction.

We have on our table two recent reports issued by the same public analyst—Mr. A. W. Stokes, F.C.S.—but for two very distinct districts, namely, Paddington, at the West-end of London, and St. Luke's, situated in the Eastern part of the Metropolis. Dissimilar and distant from one another, yet each of these districts furnishes several remarkable exemplifications of the anomalous manner in which magistrates administer the law when adulteration is in question.

Take, for instance, Paddington. A man was summoned for selling milk to which 20 per cent. of water had been added. The magistrate dismissed the case because he ruled that the full evidence must be produced that the man selling the milk was the servant of the individual whose name was on the barrow. It is not a customary thing for a man to go about the streets, offering for sale any article without the permission of the rightful owner. What, we wonder, did the magistrate imagine that the man hawking the stuff did with the money which he dishonestly obtained by representing the article to be milk, whereas it was proved by analysis to contain one-fifth of added water? To legitimately entitle him to a discharge, the man ought to at least have been able to show (under section 25) that he bought the article in the same state as he sold it, and with a warranty; but, although that evidence would have exonerated him, it does not follow that the real offender, whose name the magistrate could readily have elicited, should go scot-free. In connection with this case, we may mention that the offence was committed on Sunday, a day which, as reported in *Hygiene* some months back, is that on which milk adulteration is most prevalent. The reason is not far to seek; the labouring classes have more money in hand then than at any time, and the women treat their little ones to what they think is extra nourishment, while it is only milk plus water, according to the fancy or greed of the peripatetic thief, who goes his way, merrily rattling a

pocketful of money, fraudulently obtained, to join the owner of the barrow at a neighbouring public-house, for sundry drinks and a hearty chuckle over the latest magisterial vagary of the "werry kind worshipful beak."

On another occasion the same magistrate dismissed the summons against a tradesman who sold as coffee a mixture containing 80 per cent. of chicory, the poor fellow quite touching the heart of the magistrate by pleading that he had only recently taken over the business, and did not know that the article was adulterated. There was one occasion, though, upon which the magistrate actually convicted, and it is only fair that we should record it. The vendor of a sample of coffee containing 90 per cent. of chicory was fined 25s. Why, the maximum fine is only £50. If there had been only 10 per cent. more of chicory, there is no knowing what heavy penalty the magistrate might not have imposed on the unfortunate delinquent; possibly, as much as 30s.

On the matter of the uncertainty of magisterial decision, we must let Mr. Stokes speak. "The sale of coffee," he observes in his report to the Vestry of Paddington, "is in a very anomalous state. You are invited to 'try our celebrated one shilling coffee'; if you do so, you probably find, on reading through the printing on the package,\* that it is described as 'a mixture of chicory and coffee.' Analysis shows the chicory to form, usually, from 50 to 90 per cent. of the weight. Should you prosecute the vendor, you will find that half of the magistrates on the Bench hold that you, having asked for 'coffee,' have a right to have that and nothing else. The other half hold that you may be served with anything containing some coffee, if only it is labelled 'a mixture,' whatever you might have asked for, or the vendor have advertised to sell. . . . The Adultera-

tion Act certainly needs amendment, so that it shall be clearly defined what a label shall or shall not cover in the way of admixture. Recently a deputation from the grocers waited upon the Local Government Board with a view of amending the Act. Their proposal in regard to coffee was that it should be legal to sell as coffee a mixture containing half its weight of chicory, if only the sample were labelled 'a mixture'; and that even 90 per cent. of chicory might be sold as coffee if the proportions of chicory and coffee were given on the label. Whether the public would be satisfied with such legislation is very doubtful; nor can I see any reason why other trades may not ask to be allowed to indulge in 'mixtures,' so that the buyer could only, in future, expect to get half of what he asks for, mixed with half of something he does not want." Fortunately, the deputation had to deal with Sir Walter Foster, M.P., Parliamentary Secretary to the Local Government Board, who told the deputation plainly what he thought of such an audacious proposition, arising, we would remark, out of one simple circumstance, namely, that the trade value of coffee is many times higher than that of chicory. We wonder that this deputation had not the impudence, while about the matter, to suggest that it should be made legal to sell 50 per cent. of sugar and 50 per cent. of sand as a "mixture of sugar," or half weight of tea leaves and half weight of baked sloe leaves as a "mixture of tea."

In Mr. Stokes' report to the Vestry of St. Luke, we find it stated that, in the case of a sample of brandy which was submitted for analysis, it was found that it contained  $8\frac{1}{2}$  per cent. excess of water, *i.e.*,  $8\frac{1}{2}$  per cent. beyond the legal limit of 25 under proof. Tolerably strong proof of adulteration, this—our readers will probably think; but they have apparently forgotten that magistrates vary in their interpretation of the law. The vendor pleaded, in answer to a summons taken out against him, that there was a notice in the bar, stating that

\*This is rarely done, we expect, and how would it be in the case of an illiterate purchaser? Besides, the package would, generally, be soon torn open and thrown aside.



all spirits sold in his establishment were diluted according to quality. If there were any force in this defence, it would apply equally whether the addition of water amounted to 8 or 75 per cent. In each instance the spirits would be undoubtedly diluted according to quality; and, in the latter instance a publican might dub his tavern, "The Wilfrid Lawson Arms," and take up a prominent position on the platform at the temperance meetings at Exeter Hall. But we shall be accused of joking, or reminded that such an assumption is only worthy of an inmate of the large lunatic asylum which forms the chief architectural ornament of the parish of St. Luke. Our critics must not be too hasty; for the sitting magistrate held that this was a good defence, and promptly decided in favour of the teetotal publican; notwithstanding that it was pointed out to him that another magistrate, occupying the same Bench, had decided, only a few days before, in the case of a sample of rum which contained four per cent. of water beyond the legal limit, that such a defence was untenable, and consequently fined the vendor. "So that," as Mr. Stokes comments in his report to the Vestry, "we have the anomaly of two magistrates sitting on the same Bench giving opposite decisions on the same defence. The original Adulteration Act of 1875 contained no standards or limits of strength; but the Amended Act of 1879 expressly states the legal limit for all spirits, the evident intention being that spirits should not be retailed below these strengths. There is frequently a cry that the law should fix some standard for milk, beer, butter, and other articles, but experience shows that the only limits yet legally fixed by Act of Parliament (those for spirits) are useless, if each magistrate is at liberty to disregard them." Further on, Mr. Stokes directs attention to the different manner in which magistrates deal with offences, where the Excise Department is concerned. If the vendor, whom we have just referred to as getting off under so transparent

a defence, had been summoned for adding a corresponding proportion of water to his beer, there is no doubt, says Mr. Stokes, and we are of opinion with him, that the same magistrate would have imposed a penalty, in spite of the defence which was successful on the occasion in question. "It is a mystery," he adds, "why Excise cases invariably go against the publican, and result in fines, seldom under £25, while cases undertaken by vestries to protect the public from adulteration, are either dismissed on some legal subterfuge, or are met by the imposition of a five or ten shillings fine." It is, indeed, a mystery, in addition to which it tends to bring the law against adulteration into disrepute and disuse, and to deprive the public of the benefit of one of the most useful Acts in the Statute-Book.

### PUBLIC HEALTH REPORTS.

*Surbiton and New Malden, Surrey; Teddington and Hampton, Middlesex.*—It has never before happened to our lot (and, indeed, could seldom happen) to receive on the same day four reports showing such a low rate of mortality as is evidenced by the annual statements just submitted to their respective sanitary authorities by the medical officers of health for these places; practically through their connection with London by rail, suburbs of the Metropolis. They are all within easy reach of London, and are all situated in the Thames Valley district, two of them on the Surrey side, the other two on the opposite bank of the river.

During the past year the death-rate of each was as follows:—Hampton, 14 per 1,000 (population, 5,800); Teddington, 13·3 per 1,000 (population, 10,525); Surbiton, 11·94 (population, 10,134); and New Malden, only 8·57 per 1,000 (population, 3,550). There has been, of late, a good deal of controversy in the papers as to the relative advantages of residence in or out of London. If all suburban localities could show as satisfactorily low a death-rate as the

four we have enumerated, there could not be much hesitancy in deciding the question, from a sanitary point of view. Any one of them "must, indeed, be a healthy place," as an old lady once said in our hearing, under somewhat amusing circumstances. We were travelling down by the Great Eastern Railway to one of the numerous small and attractive watering-places on the East Coast. After leaving Colchester, and as our train was getting within a few miles of its destination, an old lady, who was accompanied by three young ones, commenced to descant for the twentieth time on the salubrious reputation of the seaside resort to which she was escorting her youthful relatives. One may have too much of ever so good a thing (as La Fontaine humorously points out in "*Toujours perdrix*"), and this final outburst of rapturous approval of the place which the old lady had evidently selected for the family trip—consequently, she was proud of her discrimination, and determined to make the most of it—was more than any occupant of the carriage felt disposed to put up with, especially as we had all fairly fallen in with her eulogistic mood up to then. "It must be a healthy place," continued the old lady, apparently unconscious that everyone was studiously avoiding conversation on the well-worn theme; "why, it says here in the local paper"—which she had purchased at Colchester—"that Dr. So-and-So, the eminent physician, has taken a house there, to live in during the summer months." "Oh! that is nothing," we remarked rather curtly, scarcely troubling to look up from our books; "Sir William Gull was born in the adjacent parish!" "Then it must, indeed, be a healthy place," triumphantly exclaimed the old lady; and it was not until a hearty laugh from all the other occupants of the carriage showed her how completely she had fallen into the trap that she noticed the blunder she had made. However, no one had laughed more heartily than she then did, and we arrived shortly after, in a merry mood, at Clacton-on-Sea. We met the same

party several times afterwards on the pleasant promenade and pier, and some arch allusion to the health-giving qualities of the sea-air was generally made by the younger members.

But we must return to our subject. We spoke of the lowness of the mortality of the four districts named. During the same 12 months the rate for all England and Wales was 19 per 1,000; from which fact it is obvious that such a low rate as Malden and Surbiton especially enjoyed would have meant a saving of very many thousands of valuable lives throughout the country.

*Teddington* is in point of population largest district of the four, having the estimated number of 15,525 inhabitants. The birth-rate for 1892 was 17·9 per 1,000. Out of the total deaths, 25 were those of children under one year of age. Consumption was debited with a larger number of deaths than any other disease, viz., 22; next in order come bronchitis, pneumonia, and pleurisy, 19; heart diseases, 12; influenza, 9; and cancer, 8 deaths. Although Dr. Gunther is able to record a satisfactory mortality rate, there are numerous sanitary improvements only now receiving attention, amongst them the general sewerage of the district. Dr. Gunther particularly urges on the Local Board the desirability of taking into consideration at an early date the question of providing an isolation hospital for cases of infectious disease.

*Hampton*, the "'Appy 'Ampton" of Cockney visitors to its famous palace at Hampton Court and other pleasant resorts, is not far from Teddington. Dr. Tyndale, the Medical Officer of Health, reports that the chief epidemic during the past year was one of measles, which necessitated the closing of one of the schools. There was only one case of typhoid; this was imported, and proved fatal, as did also some cases of diphtheria. Referring to the causation of some of the diphtheria cases by sewer gas, Dr. Tyndale points out that a proper system of drainage is a great desideratum in Hampton.



*Surbiton*.—As Dr. Owen Coleman, the Medical Officer of Health, observes in his report, its sanitary condition has been repeatedly the subject of animadversion in the local press and elsewhere, owing to the persistent manner in which a few of the residents brought forward real or imaginary grievances; and as a consequence of this, a special commissioner from a leading medical paper was sent down to make a report. He certainly must have worked at some disadvantages, seeing that neither the Board nor any of its officials were apprised of his visit until afterwards; the natural result of which was that the commissioner had insufficient data to go upon. The amount of suspicion and mistrust thus aroused, led to another special report—this time by Dr. Seaton, the County Council Medical Officer, at the request of the Surbiton Improvement Commissioners. Dr. Seaton's report was, on the whole, of a favourable nature, and Dr. Coleman's annual report shows that the alarmists were a little precipitate in their denunciations. The death-rate for 1892 was 11·94, as against 13·6 per 1,000 in the previous year. The zymotic death-rate was only 0·3 per 1,000, the four deaths from zymotic diseases being registered as follows:—Whooping-cough, 2; measles, 1; diphtheria, 1. The attitude of the alarmists reminds one of the answer given by the captain of a ship to the anxious inquiry of a nervous passenger during a passing storm at sea:—"Is there much danger, Captain?" "No," was the reply of the captain, who had been troubled with the same question a dozen times in as many minutes, "there is not much danger, but there is a great deal of fear."

*New Malden*.—Medical Officer of Health, Edwin Child, M.R.C.S., L.S.A. Population, 3,550. Birth-rate in 1892, 24·78 per 1,000; death-rate, as already stated, 8·57 per 1,000. Only 30 deaths were registered, one of these being that of a non-inhabitant. This is lower than any number since 1883, when the population was considerably less than it now is. In

1890 and 1891 the total deaths were 47 and 49 respectively. It is a fact worth mentioning, in connection with the small mortality during the past twelve months, that 7 out of the 30 deaths (almost one-fourth of the total) were those of children under one year of age, and 15 (exactly one-half of the whole number) were those of persons who had reached or passed their 65th year. Another peculiarity is that, in 1891, one-fifth of the deaths were due to chest diseases; the proportion was identically the same last year, including two deaths in which influenza was the primary cause. A good many cases of measles occurred, but none were fatal; one death was recorded from typhoid fever. Influenza appears to have been remarkably prevalent, though fortunately for the most part of a mild type. As this disease does not come under the Notification Act, Mr. Child is unable to definitely state the number of cases occurring in the district within the twelve months, but he believes that it could not have been less than 800. Speaking of the Notification Act, Mr. Child says that the public do not yet fully recognise their duty under this measure, or the importance of its provision being properly carried out. He mentions, by way of illustration, two cases of measles which, not having been notified, were discovered by mere accident. In one of these families where measles existed, the grandmother was a monthly nurse; in the other several members were attending school, thus running the risk of conveying the disease to fellow scholars. Mr. Child directs the attention of the local authority to the expediency of establishing an isolation hospital.

*Kettering, Northamptonshire*.—(Rural Sanitary District.) Population, 9,850, two large villages formerly included in this district, namely, Rothwell and Desborough, having recently acquired separate powers, and been created urban districts. As showing the stationary character of the population, the Medical Officer of Health (Dr. Dryland) can only point out one village in the districts, whose inhabitants have

increased in number since the census of 1891. Birth-rate for 1892, 35·6 per 1,000, death-rate, 14·3. No death was recorded during the twelve months from small-pox, scarlet fever, diphtheria, or typhoid fever, and the zymotic death-rate was only 0·7. The Notification of Diseases Act has worked very well; but there is great need here, as in many other districts, of a proper hospital for the reception of infectious cases. With small-pox threatening to extend from various large towns in the North of England, where it is already present in an epidemic form, and with the possibility of cholera invading this country during the coming summer, sanitary authorities should lose no time in remedying this great defect in their arrangements for coping with epidemic outbreaks. Absolute prevention of infectious diseases is an impossibility; so that prompt isolation forms a second line of defence, of which it is difficult to over-estimate the importance.

*Kensington.*—Dr. Orme Dudfield, Medical Officer for this important Metropolitan district, states in his first monthly report for 1893, that the death-rate for January was equivalent to an annual rate of 23·2 per 1,000, being an increase on the three preceding months, during which the rate was 14·4, 13·1, and 15·1 respectively. The rate for the whole Metropolis in the same month (January) was 27·1 per 1,000, or 3·9 above that for Kensington. Fifty-seven of the deaths registered in Kensington were of children under 5 years of age (including 39 under 1 year of age), while 119 persons died at the age of sixty years and upwards. The deaths from the principal zymotic diseases were only 10 (or 12 below the corrected decennial average), viz.:—diphtheria, 5; scarlet fever, 2; whooping-cough, 2; and enteric fever, 1. No less than 124 deaths were attributable to diseases of the respiratory organs; the mean temperature of the air during the month being 34° 2 Fahr. (3° 7 below the ten years' average). As a rule, abnormally low temperature means a high death-rate, especially amongst the very young,

and persons advanced in years, and those who are in a weak state of health, or of feeble constitution.

The epidemic of scarlet fever which has so long prevailed in the Metropolis, and has at times so severely taxed the accommodation-resources of the hospitals for infectious diseases is now happily on the decline; the number of cases notified during January being 1717, as against 3755, 2789, and 1968 in the three preceding months.

But there is another infectious disease which is occupying the serious attention of metropolitan sanitary authorities, namely, small-pox. This has been alarmingly rife in some of our large Northern towns, and is steadily working its way southward. Several deaths from this disease have recently occurred in London, and at the end of January there were 98 cases under treatment in hospitals as against 5 cases on November 5th, and 19 and 39 on the 3rd and 31st of December. Comparatively few of these cases have been persons with a settled residence, and the sources of infection have been undiscovered, the disease having, no doubt, been contracted through the patients having come in contact with infected persons in the streets and low-class public resorts. In a report on this subject, the medical superintendent of the hospital ships observes: "The disease has as yet got but little hold upon the settled population of London. It has been imported by tramps and others from the provinces, and such importation is continuing, is likely to continue, and cannot be prevented. The class which so far has been almost entirely affected is the vagrant class, and the disease is being spread by persons of this class coming in contact with one another in the casual wards of workhouses, and other places. . . . Every casual ward in London is acting as a source of infection. But it is, of course, unlikely that this limitation will last, and sanitary authorities should lose no time in setting their districts in order. Dr. Dudfield has taken time by the forelock, and issued the



following notice to the keepers of all common lodging-houses in Kensington; he has also forwarded copies to the Clerk to the Guardians, and to the police authorities having the supervision of the common lodging-houses:—

“SMALL-POX.—This disease is spreading in London. So far, most of the sufferers have been poor persons who usually sleep in casual wards, shelters, and common lodging-houses, and tramp about town and country by day. I ask your help to prevent the further spread of the disease, by careful inspection, night and morning, of the people who sleep at your house. Small-pox commonly begins with pains in the head and back, and sickness. But one or other of these signs may be absent, as all cases are not quite alike. Should any lodger complain of illness of this character, I beg you to obtain a medical order from the relieving officer before such person leaves your house, and especially if there is any rash. The rash of small-pox comes out on the third day of illness, as small hard pimples, which soon get bigger and soften, and then they contain fluid, and are like little blisters. In your own interest, as well as in the interest of public health, I hope you will give this matter your serious consideration.”

In a recent number of *Hygiene* we published an article on “The Needs of the Metropolis in respect of Hospital Accommodation for the Infectious Sick,” by Dr. Dudfield, setting forth his views on this matter. The conclusion at which he arrived was that “provision should be made for not less than 5,000 beds for scarlet fever, fever, and diphtheria, and for isolation;” and that such accommodation was deficient to the extent of 1,200 beds. Since then the Metropolitan branch of the Society of Medical Officers of Health have had the question under consideration, and not only endorsed Dr. Dudfield’s views, but passed the following resolution, copies of which have been sent to the Local Government Board, the London County Council, and the Metropolitan Asylums Board:—“That the permanent hospital accommodation of London for infectious disease is insufficient, and in the interests of public health should be increased forthwith.” The Metropolitan Asylums Board has a specially appointed sub-committee to examine into and report on the whole question of fever accommodation.

## REVIEWS AND NOTICES OF BOOKS.

A TREATISE ON PUBLIC HEALTH, AND ITS APPLICATION IN DIFFERENT EUROPEAN COUNTRIES. By Albert Palmberg, M.D. Translated from the French edition, by Arthur Newsholme, M.D., D.P.H., p. 539. London: Swan, Sonnenschein & Co., 1893.

ALTHOUGH several excellent treatises exist on the subject of Public Health, this is the only one of its kind, dealing specially as it does with the sanitary organisation of many European countries, viz., Great Britain (England and Scotland), France, Belgium, Germany, Austria, Sweden, and Finland, to which last-named country the author belongs, being the Medical Officer of Health for the district of Helsingfors, which is the capital of Finland. As regards the countries which are passed over in this volume, Dr. Palmberg remarks that the public hygiene of Denmark, Norway, Holland, and Italy would doubtless have proved instructive; but that he has not included them, because he has not seen and studied their methods on the spot. We hope that in a future issue he will be able to remedy the omission, if not from personal investigation, at any rate from trustworthy contributors resident in those countries.

As regards Denmark, a valuable chapter could be compiled from the remarkable work which was reviewed some time ago in our columns, viz., “Denmark, Its Medical Organisation, Hygiene, and Demography,” a volume of 474 pages, produced by a committee of Danish medical and other professional men, and published at the expense of the Danish Government, as a contribution to the seventh International Congress of Hygiene, held in London, in 1891.

The work of translation of Dr. Palmberg’s treatise has been painstakingly and admirably performed by Dr. Arthur Newsholme, Medical Officer of Health for Brighton, and author of

some well-known hygienic publications. The Section on England, which occupies more than a third of the entire volume, has been revised and brought up to date by Dr. Newsholme, and constitutes a valuable summary of English sanitary legislation and administration.

Dr. Palmberg pays an eloquent tribute to the lead which our country has taken in public hygiene. "Of all countries of the civilised world," he writes, "none has a sanitary code so complete and so precise as in England. In addition, English legislation is distinguished from that of other countries, by the fact that the principal regulations emanate from Parliament instead of being simple administrative orders. Thus the legislation is the work of the nation, which has recognised its necessity in its own interest. Consequently, the laws are respected, and, as a rule, religiously observed, without objection or murmur.

"In the whole country, the marvellous results which have been produced can be seen. Thanks to these laws, the rate of mortality has been lowered, the mean duration of life increased, the amount of sickness diminished. They have greatly alleviated the misery in the houses of the poor."

Long before other countries began to appreciate the importance of public hygiene, England had arrived at a clear recognition of it, and the ravages of cholera in 1832-33, undoubtedly gave a great stimulus to sanitary legislation and improvements. In 1836 the General Register Office, with the Registrar-General at its head, was established; the Poor Law Board, charged with the control of the system for the relief of the poor had been established two years previously. In 1838 there appeared an interesting and instructive public document, prepared by special commissioners entitled, "A Report on the Sanitary Condition on the Labouring Population of Great Britain," and much good resulted from this and similar subsequent commissions. In 1848, Parliament passed the first Public Health

Act, and the provisions contained in this measure were amplified into the Public Health Act of 1875, which, as carried out by a central authority, the Local Government Board, and by local authorities, the Local Boards of Health, is the basis of sanitary administration throughout the length and breadth of the country. Scotland and Ireland have in part their own laws, while the Metropolis has a special sanitary organisation, under the Public Health (London) Act, 1891.

So far as legislation goes, we have arrived in England at a state of comparative completeness, while every year shows progressive practical improvement in our large towns, and best-managed rural districts. It is in the small towns and country districts that sanitary progress is slowest, where the so-called vested rights of property, selfish individual objections, apathy, or ignorance block the way. But that the last fifty years have seen more hygienic advances than any preceding corresponding period no one can deny; while the future is full of promise. Never, again, can we revert to the disgraceful state of things exposed and remedied by the able sanitary pioneers whose efforts at the commencement of the Victorian reign have culminated in the best system of public hygiene ever known in any country.

If we were asked to point out any one sanitary arrangement in which we are behind Continental States, it would be the mode in which animals intended for human food are slaughtered. In France, Germany, and Austria, for instance, all slaughtering must be done at the public abattoirs, thus insuring a minimum of public nuisance, with a maximum of protection against the exposure for sale of unwholesome meat, owing to the increased facilities of inspection. In England, unfortunately, although the system of private slaughterhouses is constantly denounced, the legislation on the subject is of a permissive character. A very useful and, at the same time, easily drafted Act of Parliament, doing



away with every private slaughterhouse in towns after a definite date, is one which would meet with general approval, and would be passed without any opposition worth speaking of.

It is impossible to review at any great length a book like this treatise, seeing that it is of the nature of a compendium. But we hope to refer to it again in a future number, and to give occasional extracts. It is a book which should be in the library of everyone interested in sanitary science. We had almost omitted to mention that it is copiously illustrated, containing a large number of wood-cuts of different sanitary apparatus.

### HYGIENIC NOTICES.

**CIGARETTES.**—One very great objection to the smoking of cigarettes, as ordinarily sold in the shops, has always been that the tobacco is enclosed in paper frequently containing arsenic or other injurious chemical substances. We have lately received from Messrs. Goodbody, wholesale tobacconists, of London, Dublin, and elsewhere, samples of their cigarettes, in which this objectionable condition is wholly done away with, as the casing is formed with a fine tobacco leaf, no paper whatever being employed for that purpose. We can highly recommend Goodbody's cigarettes, both on this account, and because they are made of the best Virginia tobacco.

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**NATUREFORM SHOES.**—There are few adults who are not suffering in some degree from the consequences of their feet having, in early childhood, being forced into boots and shoes wholly unsuitable to them. Messrs. Holden Brothers have sent us a specimen of their Natureform Shoes for young children. The distinctive name sufficiently indicates the system upon which these shoes are made, viz., adaptation to the normal shape and size of the feet. At first, they look somewhat peculiar, owing doubtless to the fact that people have so long ignored the natural form of the young child's foot and the necessity that exists for using shoes in which that

shape is preserved, thereby allowing free movement and growth of the foot, and entirely obviating distortions of the feet, as well as spinal and other affections indirectly due to cramping and twisting the growing feet.

### NOTES AND NEWS.

#### FAIR QUESTIONS.

Lady with the shining hair,  
Holding all the charms and graces,  
Stately, kind, and passing fair,  
Could you wash the children's faces ?  
When the rosy morning bright  
Paints with gold each roof and spire,  
Banishing the shades of night,  
Could you start the kitchen fire ?  
O'er the fields with thee I wander,  
Summer's glory overhead ;  
Charmed, I all thy virtues ponder—  
But could—ah, could you make good bread ?  
Eyes so deeply, truly tender,  
Clear as water in a pool,  
Answer my heart's importuning—  
Have you been to cooking school ?

—Helen M. Winslow.

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**INFLUENZA** is becoming very prevalent in London and many parts of the country. Amongst those invalided by this complaint are Mr. A. J. Balfour, M.P., Mr. George Russell, M.P., Under-Secretary of State for India, Mr. Strachey, M.P., and Mr. Macfarlane, M.P. for Argyllshire. Twenty-seven deaths from influenza were registered in London last week.

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**DIPHTHERIA** continues excessive in the Metropolis, and 60 deaths from it were recorded last week, as against the average, 23.

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**CONSTANT WATER SUPPLY.**—The London County Council have caused notices to be served upon the New River Company and the West Middlesex Water Company to give a constant supply in two large districts supplied by them, namely, Central London and the West and North-Western parts of the Metropolis.

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**LONDON BOARD SCHOOLS** must be in a very bad sanitary condition, judging by the statement made by a prominent member of the School Board that 300 out of the 360 schools require careful overhauling, at an estimated cost of a quarter of a million pounds.











